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MEDICINE'S NEED FOR HISTORY.[1]

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AT the inauguration of an annual liaison between history through the Historical Society of Queensland, and medicine, through the British Medical Association, may I be permitted to express my appreciation of the honour of being asked to give the inaugural lecture. I do so with the sincere belief that history and medicine are not "as the poles apart", but should be regarded as working partners in a community enterprise.

Defining History.

Our first objective must be clarity concerning definitions. To some, history denotes dry ancient books on forgotten events; to others it is a museum for out-of-date pictures, furniture and vehicles. This is not our view. History may be defined as the "story of the past", embracing not merely things and events, but also trends and motives. It is in essence a saga of man's life on the planet—involving the efforts of millions of people. The actors have been saints or tyrants, heroes or rascals, gluttons or wastrels. The result through the ages is the scene of today.

In order to understand the significance of such pressing problems as democracy, delinquency, monetary control, medicine or the law, the aid of history must be invoked. The reason is revealed by consideration of that fourth dimension in which we live. If 100 painters were commissioned to paint a picture on a canvas ten miles square, it would necessitate considerable journeyings and conferences in order to maintain harmony of colour and form. Mankind is painting the story of civilization on a far vaster canvas. Millions of inhabitants are involved on a globe whose circumference is 25,000 miles. Innumerable journeys have to be undertaken and there are countless conferences, but here the similarity ends. The pattern of civilization is in constant flux. Workers die, techniques alter, forms change. Another dimension has been added. The painter on canvas achieves a third dimensional effect of depth. Mankind in his global panorama adds the fourth dimension of time.

The Fourth Dimension.

Time is all important. Whilst the life of an individual is vital to himself, equally vital, in a global sense, is the life of his son and his son's sons. The individual must therefore view his actions with reference to posterity.

[1] A lecture delivered on April 11, 1958.

Time, the inexorable, should be recognized in all major deliberations. Man must consider the past, the present and the future since they are indivisible.

For primitive people (and our own until recent times) the fourth dimensional aspect was regulated by tradition and religion. By this means, past, present and future were nicely adjusted. Every man knew with reasonable precision and certainty his place in the cosmos and his duties to his ancestors and descendants. Today we are living in a new world. Old rules of conduct are undermined; traditions are vanishing; the shackles of the past have been broken—we can rejoice in a new freedom. For our edification and enlightenment new means of communication are provided; wireless, teleprinters, twice-daily papers, television, periodicals and books without number are at our service. We are free to travel widely, but it is freedom through a sea of confusion without a compass. We must set our own course.

Man's scientific triumphs are misleading, in that although they suggest his possession of marvellous intelligence, discoveries are the fruit of many minds. The average individual intelligence is strictly limited, since only one idea at any second can be held intact. Memories are short. Bogged down in trivial affairs, the ordinary man has little time or opportunity to wander far in fields of thought. If we were asked to symbolize the intellect of an average person it would not be as an Einstein unravelling the secrets of the universe, but rather as a hen immersed in the toil of daily living, picking corn and mothering chicks.

Such symbolism is true for most sections of our community, including the student of medicine, immersed in the tedious task of treating individual sick people. There is little time or opportunity for consideration of past and future. The accent is on today. The result is an outlook which inevitably lacks the fourth dimensional impact of time. As the trend to specialization is progressive, the over-all vista is automatically narrowed. There is, therefore, in all branches of medicine an increasing need for the widening process which only history can provide.

Defining Medicine.

Viewpoints differ concerning the scope of medicine. Too frequently the outlook is parochial. A "medico" is "the quack" who cures illnesses; medicine is a term applied to his "know how" of treatment. The science of medicine has, however, outstripped the parish and holds a key position in human progress. The existence of an active World Health Organization shows its world-wide impact. Disease and nutrition campaigns embrace nations and continents. World health movements are achieving the eradication of such diseases as malaria, syphilis, poliomyelitis, yaws and beri beri. Plans are mooted to conquer the mental diseases of schizophrenia and other nervous disorders on a global scale. It is recognized that mental invalidism is not limited to individuals; masses of people can be conditioned to behave in an abnormal manner. The dancing manias of the Middle Ages are simple examples, but such outbreaks are relatively insignificant compared to the mass hysteria which has been produced by modern demagogues. Napoleon, Hitler, Mussolini and others have led nations to disaster through processes whose study is in the ambit of medicine.

Man in the mass, in spite of the artistic and scientific triumphs, is, in basic emotional patterning, not far removed from the savage. The dictum that "civilization is only skin deep" is based on reality. Carleton S. Coon (1957) claims that we twentieth-century atom men have retained the viewpoint of our Neolithic ancestors, which was: "You stay in your village and I will stay in mine. If your sheep eat our grass we will kill you, or we may kill you anyhow to get all the grass for our own sheep. Anyone who tries to make us change our ways is a witch and we will kill him. Keep out of our village." Man's most pressing problem is not the "know how" of providing material for utility, pleasure or raising the standard of living, but how to control emotions so that outlook and actions can be accurately balanced in order to conform to world society. The problem for the mass, as for the individual, is in essence the medical problem of psychological control.

All of us are aware of the personal cycle of "cradle to the grave", or "birth, decay and death", but how few realize that a similar cycle occurs in aggregates of mankind. The following principles can be adduced from history: (i) there is a tendency for all races to achieve a state of equilibrium and then decline; (ii) racial equilibrium depends on the delicate adjustment of many factors; (iii) race decline can be gradual or catastrophic. The usual sequence of events is gradual deterioration through factors which when uncontrolled lead to a point of no return. The climax is national submergence.

Historical Parallels.

A chronology of world events reveals historic landmarks of victory and defeat, decay and submergence. Egyptians, Persians, Assyrians, Babylonians, Hittites, Greeks, Cretans, Phœnicians, Romans, Musselmen, Tartars, Spaniards have marched to triumphs which could not be maintained. It would be naïve to suppose that any nation of today is immune from a process which has so consistently occurred in every age, irrespective of race or creed. As historians and physicians we should study history in order to discover clues which could have a bearing on our own national future. Are we already on the road to decline? If so, can we retrace our steps?

Before embarking on our search, the delicacy of the adjustment which is necessary to survival must be appreciated. In order to do this, let us copy the chemist who controls reactions within a test tube. A parallel occurs in two small races of primitive people, the People of the Deer and the Patagonian Aboriginal, who, for thousands of years, lived successfully in a static environment. Both survived extremely harsh conditions. They limited their progeny to manageable dimensions and conserved food supplies. The People of the Deer received repeating rifles in place of bows and arrows. The deer on which they lived were slaughtered in thousands and, with their passing, the hunter's source of life departed. Another human race was on the way to extinction (Mowat, 1954). The Patagonian natives owed their downfall to disease. Measles was introduced and the community was virtually annihilated (Bridges, 1951). Such examples show that continued existence of a race can depend on a hair line which separates prosperity from failure. Food conservation and prevention of disease may be the deciding factor.

Changing Factors in Disease.

It may be thought that medical knowledge is sufficient to prevent food deficiency or danger by germs. Such views are hazardous. Our bodies are complicated built-in chemical laboratories, evolved ages ago under primitive conditions. Already we are discovering disquieting facts. Longer life span is being purchased at the cost of increasing numbers of the aged whose survival creates new problems. The pleasant prospect of universal living to a ripe old age is losing some of its attractiveness. Housing, food and hospitals must be provided by the young, who already face increasing burdens. Thousands of decrepit and mindless individuals are to be kept alive in a twilight of existence, which connotes misery to themselves and worry to their relatives.

While some diseases are on the wane, others are on the increase. Mental ill health is an increasing tax on the community. Psychosomatic diseases are becoming more numerous. Widespread "refinements" in food production have had serious repercussions in ill health. Not merely is mastery of existing diseases incomplete; germs and viruses are learning to thrive on drugs which, a year or two ago, were fatal to them. The history of past epidemics is a tragic story. Pestilence is often a greater killer than war. In our life time we can remember, among others, the death roll of the great influenza epidemic after the first World War, the ravages of typhoid in the South African War and of typhus in the Balkan Wars. The

Black Plague of the Middle Ages is a grim reminder not merely of death to large numbers but also the dislocation to community life with far-reaching consequences. A quarter of the whole population of Europe, 25 million out of 100 million, were destroyed (Zinsser, 1950). It may be thought that, as we now understand carriage of disease by lice, fleas, contaminated water, flies, rats and mosquitoes, the history of past epidemics has but slight significance. Such thinking is of the ivory castle brand.

Life is never static. We are losing resistances to certain germs, and germs are evolving in their race for survival. Owing to their extraordinary rate of reproduction, the possibilities of a new variety by mutation is very real. The delicate balance between immunity and disease may be tipped against us. The rapidity of international travel fosters air-borne and contact dissemination of disease on a world scale and is creating a situation which may be difficult to control. We would indeed be well advised to continue to read and disseminate the history of epidemics as a spur to continued vigilance in the field of public health.

Automation and the Welfare State.

As an instance of the odd way in which history can impinge on medicine may be cited the coming of automation. Modern machines can dispense with manpower in a fantastic manner. History reveals that through the ages the average man has had to work long hours for food, shelter and the right to live. His behaviour has been geared to appetites and insecurity. Automation sets our psychiatrists a problem of great magnitude. How will boundless idleness affect the individual and the nation? Can we so harness leisure that the end point is not a vicious but a benign circle? Can we avoid stultifying complacency on the one hand or tyranny and slavery on the other? As in the present struggle between democracy and totalitarianism, mass emotional inhibitions, frustrations and repressions are involved; these bring the problem into the realm of medicine.

That basic urges influence the production of nervous disorders is shown by the creation of neuroses resistant to treatment through our expanding pension ideology. The greatest healing influence in disease is man's urge to recovery. If a reward is given for invalidism, it is not surprising that the illness may become chronic. The astronomic rise in the number of pensioners suffering from chronic neuroses, within the last half century, poses a serious problem in health resistance which must be eventually faced.

Our test tube races—the People of the Deer and the Patagonian—point to a common factor in race survival. The size of families was limited, so that food and living space could remain adequate. The machinery for limitation of family varies in different races. In some it is by a vigorous taboo against intercourse within certain periods. Surgical mutilation is used in others. Prolonged lactation is often employed. In addition, hazards of child bearing, disease and pestilence play a major part in preventing over-population. Today medicine has triumphantly changed the scene and many dangers of childbirth and babyhood have disappeared. The result is an increase in population rate which is not merely alarming for countries which have restricted food sources but also to neighbouring nations who face an alien influx which could destroy their racial balance. At the same time medicine has introduced another innovation—that of the prevention of pregnancy by contraceptives. The result is selective limitation of the intellectually fittest members of the community, since the less intelligent do not use contraceptives. A parallel example is shown in Roman history. Bread and circuses were provided for the indigent, and the thriftless were encouraged to fertility. Coexistently, the hardy stock who had created the grandeur of the Roman Empire practised birth control. The result contributed to their submergence (Bostock and Nye, 1934).

Concerning the social problems of today and tomorrow, the historian should remind the doctor that the introduction of new techniques has boundless possibilities for both good and evil. Duty does not end with the dissemination of new ideas. There is a duty to see that they are not abused. The result of innovations and discoveries may be race extinction. As will now be shown the unexpected may happen.

Danger of the Unexpected.

In Egypt about 1375 B.C., Amenhotep IV had the revolutionary idea that "Aton—the Sun God" was "God over all the world". Everyone was made to worship Aton, and temples of the old gods were closed. The priests were cast out. Amenhotep abandoned Karnak, forsook Thebes and built a new city. He even changed his name to Iknaton or "profitable to Aton" (Breasted, 1935). This great ruler not merely produced a new and beautiful monotheistic religion but also social reforms of great merit. Vast changes took place almost overnight. On his death reaction quickly occurred. The dispossessed theocracy returned to power. Chaos gave opportunities for the outsider. In the process the Hittites and others seized the northern territories. The nation declined.

The story of Iknaton has a perennial significance. "Almost overnight"—in a historic sense—medicine is being carried along on the band-wagon of a new Welfare State ideology. It is implied that from the cradle to the grave man can have security. The vision is magnificent. Iknaton had similar revolutionary views and would doubtless have incorporated universal welfare in the great poem for which he is famous, but is it practical to toss over the age old creed of "survival by effort" to one of "survival by right"? In a world peopled by races who still retain their underlying neolithic psychology, are we not expecting too much? May we not, in the chaos which may follow, have to revert to our older creed? History hints that we should slow the speed of change and not attempt too much too soon.

The old empire of the Maya civilization of central America flourished from A.D. 200 to A.D. 610, and its civilization must have been remarkably efficient (Ceram, 1952). Temples were large, hewn in stone and beautifully carved. A calendar, more accurate than our own, ruled the lives of all citizens. It seems probable that insistence on living according to a rigid plan led to the Mayan downfall. At certain dates, set in advance, the temples were evacuated and new ones built. The arrangement was satisfactory, since it created new areas for cultivation as the soil became exhausted. The procedure endured for centuries. Unfortunately, working to strict routine proved tragic, because new temples and habitations were always built in a centripetal direction. As a result all the soil in the interior of the triangle of cities became unfertile. Of necessity the nation had to leave all buildings and trek to the wilds by a mass migration.

Today the futilities of such a life plan leading inexorably to chaos seem obvious. It is, however, notorious that when in a forest one cannot see the horizon for trees. Are we certain that our own horizon is not obscured, since, as already mentioned, we are creating conditions which historians of a century hence may consider were equally obvious booby traps.

Survival of the Fittest.

Throughout history, and in a biological sense throughout the universe, there is an ever-present theme, a cord of steel woven into the fabric of life—that only the fittest survive. The rule may be tested by search through literature or art, biology or medicine, sociology or archæology; the result is the same; time is the leveller. Survival is not a matter of years or even decades; the result of any action will only be seen in its entirety a hundred years or a thousand years hence. In the interim a single mistake will, by a series of vicious circles, result in scores of unexpected end results, which added together spell ruin.

History shows that race security is dependent not merely upon the race fitness but also on racial pressures from without. As an example may be cited the Hittite empire which rivalled that of Egypt. Correspondence

between the Hittite king and the King of Egypt reveals that they wrote as equals (Ceram, 1957). In spite of its power the Hittite empire vanished almost overnight, through the pressure of population influx from the east. The Minoan civilization of Crete in all probabilities had a similar ending. Examples could be multiplied.

It is clear that survival must depend on virility, watchfulness and adequate preparation for attack. It reposes a tremendous responsibility on medicine. There can be no strong defence unless backed by a population having "healthy bodies and healthy minds". Our task is not merely writing of prescriptions, operations in surgery, or prophylaxis in public health; it should include an ability to give top-level advice on the parliamentary, public service and community problems, ranging from the immediate present to a century ahead. The latter role is quite impossible unless backed by an intimate knowledge of the interplay of historical forces and their results. An alliance between a Historical Society and the British Medical Association draws attention to the essential machinery for such studies.

History and Therapy.

The bread and butter of medicine is the treatment of the individual for disease. Numerous proven remedies are so old that their origin may be said to be historic. Often they were used by herbalists who passed on the secret from mother to daughter or from father to son. One might cite the digitalis leaf used for heart disease, *Ephedra sinica*, producing ephedrine used for asthma, cocaine from the coca leaves, curare, the arrow poison. It is certain that the list of such medical aids has not been exhausted. Clues to others could be obtained by the recording of herbal remedies used by all races. Certain medical historians have specialized in this branch, but there is room for more work. Research on the potentialities of any drug is extremely time consuming; this increases the importance of the initial fact finding and recording which is the historian's task.

An ancient, a lady of more than eighty years, who could still trudge ten miles a day in inclement English weather, told me that the secret of her longevity was the constant use of herbs. She gathered them by the roadside and presented me with a sufficiency for the coming year. With regret at my shortcomings as a historian, I must confess, names were not recorded. It is quite within the realms of possibility that an alkaloid in one of her simple herbs might have been useful in the problem of warding off the ravages of old age.

History and Administration.

As a further illustration of the intimate relation of history to medicine may be mentioned the Blood Bank Service, which plays an important role in modern medicines. The preservation of human blood is a highly technical process since temperatures must be exact and sterilization perfect. Furthermore, there must always be a sufficiency in the blood bank for emergencies and the means of dispersal to distant centres at short notice. It is gratifying that the Queensland blood bank service has an excellent record for efficiency of service and for costs which are not prohibitive to the patient. The reasons underlying the efficiency can only be understood if the history of the Red Cross Blood Bank organization is considered. In 1939 the Australian Red Cross decided to create a voluntary national movement to cater for the blood needs of the whole community. Blood was donated voluntarily. The medical profession collaborated on a voluntary basis. The headquarters staff was geared to high class research with provision for overseas visits and the purchase of modern equipment.

Other countries used other methods. Britain, in spite of the advantage of a closely knit community, was tied to a nationalized medical service and hampered by administrative difficulties. The United States of America used no less than three types of service and adopted a system of blood buying which raised prices to a prohibitive level.

It would seem undoubted that, in considering any further departure in Blood Bank organization, its origin should be remembered, since basic psychological principles in community living and administration are involved.

Prehistory and Therapy.

One is apt to think that our link with history commences with the first years of recorded history six thousand years ago. Actually, the links were forged by prehistoric man, whose story commenced perhaps half a million years previously. The use of the term "prehistoric" is misleading; the caption "early historic" is better. A wealth of evidence points to our kinship with the fishes (our gill remnants), to the reptiles (our vestiges of a third eye), to the lower vertebrates (our rudiment of a tail) and to the higher ape (erect posture). Such reminders of ancestry have a practical application. On the psychological side, fear and aggression are seen as powerful inborn characteristics. Our organic life is hampered by limitations. Aggression, anxiety and fear will be with us always, and provide us with behaviour problems.

As two-legged human bodies are adaptations of a four-footed pattern, comparable to putting a wagon body on buggy wheels, the riding will never be perfect. Our lower limbs and bony frame wear with age and stress. Whilst history does not help us acquire a new chassis, it assists in teaching us to bear our limitations with fortitude.

Prehistory can help in the elucidation of very tangible problems. For some years we have been interested in assessing the earliest time when personality patterns deviated from the normal. Instead of working backwards from adulthood, a process dimmed by lapses in patients' memories, children have been examined. The data point to important deviations occurring during the first eight or nine months of life. As an example, an asthmatic attack in middle age can have its origin in the way in which the child was influenced during the first six months of life (Bostock, 1956). Adult shiftless "Peter Pan" types of personality can emerge in the same period. Other disorders have a similar dating.

If we seek the cause, there is a simple historical possibility. Our ancestors embarked on life with deliberation; increased brain size was essential. Cerebral enlargement of the fœtus created problems concerning delivery. It was solved by premature birth and an exterior gestation period of approximately eight months (Bostock, 1951). For countless years, ancient historic man has successfully reared babies in a fashion which approximates to gestation. It is based on the maximum of security with a minimum of meddling. The infant of today is faced with a degree of insecurity and over-stimulation which paves the way for nervous disorders.

The importance of prophylaxis cannot be overstressed. If adult disease can be prevented by more care in infancy, there is obvious need for research. A necessary first step entails knowledge of the details of infant training in other races and in other times. Such a search can only partly be made by direct observation. Many races are extinct, others are inaccessible. The source must largely depend on history, involving the whole life story of different peoples. It would seem that the facts of yesterday, however trivial, whether in prehistory or recorded history, may be important for the welfare of mankind.

Conclusion.

In conclusion, it seems axiomatic that wisdom, our most precious possession, is granted even to the youngest member of our profession through a careful study of history. Against possible criticism that the end result of such study is an outlook shot over with pessimism, an emphatic disclaimer is warranted. Every experienced practitioner appreciates the clinical wisdom which accrues through the checking of therapeutic mistakes. The result is the avoidance of future errors, and the foundation of a greater optimism.

Our brief amble through the tragedies of the past is to be regarded in the same light as the clinician reviews his

failures. Knowing the pitfalls, there is a firm basis for believing that through appropriate action Man's future will be better than his past.

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STUDIES IN THE PREVENTION OF RECURRENT ABORTION DUE TO CORPUS LUTEUM DEFICIENCY.[1]

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PART I: A STUDY OF PREGNANEDIOL EXCRETION CURVES IN PATIENTS TREATED WITH CORPUS LUTEUM HORMONES FOR RECURRENT ABORTION.

A STUDY of the value of urinary pregnanediol estimations as a guide to the treatment of patients with recurrent abortion began in this hospital in 1949.

In a series of patients studied between 1950 and 1952, Alder and Krieger (1957) showed that whilst stilbœstrol failed to raise the pregnanediol excretion in patients with a history of recurrent abortion, the corpus luteum hormones, progesterone and ethisterone, did produce this effect. There was no decrease in the abortion rate in such patients treated with stilbœstrol. On the other hand the incidence of successful pregnancies increased from 36% in untreated progesterone-deficient patients to 79% in similar ones treated with these corpus luteum hormones. As larger doses of ethisterone were found to be more effective and some of the earlier patients received inadequate dosage, it was decided to continue this work, using increased doses of corpus luteum hormone on a larger series of patients. The present series of 130 patients from hospital and private practice consisted of two groups —101 who were tested for progesterone deficiency and 29 who were not. Of the tested patients, 91 had low pregnanediol excretion and received hormonal therapy. The 29 patients in the second group did not have pregnanediol tests for various reasons.

The material collected in the study of these patients has been divided into three sections. In Part I the different types of pregnanediol excretion curves found in progesterone-deficient patients are described. The value of pregnanediol excretion in assessing the amount of substitution corpus luteum hormone needed to rectify the progesterone deficiency is demonstrated. In Part II the results of treatment of a second series of patients with recurrent abortion are analysed and shown to confirm the claims of Alder and Krieger (1957) that twice as many progesterone-deficient women who have suffered recurrent abortions will have a successful pregnancy with adequate corpus luteum treatment as those not so treated. The association of progesterone deficiency with abdominal pain and uterine cramps is shown in Part III. Corpus luteum therapy relieved these symptoms and abortion was averted.

[1]This work was made possible by a grant from the National Health and Medical Research Council to one of us (V.I.K.).

Throughout these investigations the William's modification (1948) of the Somerville, Gough and Marrian method for the estimation of pregnanediol (1948) has been used. Coyle *et alii* (1955) noted gross variations in the day-to-day pregnanediol excretion in a series of normal pregnant women, and contrasted the values with those obtained using acetone instead of alcohol extracts of the toluene residue for the precipitation of pregnanediol. These workers used 500-millilitre volumes of urine from patients in the thirty-fourth week of pregnancy, when the pregnanediol excretion is maximal. In our experience the volume assayed should contain not more than one to two milligrammes of pregnanediol calculated on the basis of the previous tests. With larger amounts the gravimetric result is often much higher than the colorimetric one because of the presence of

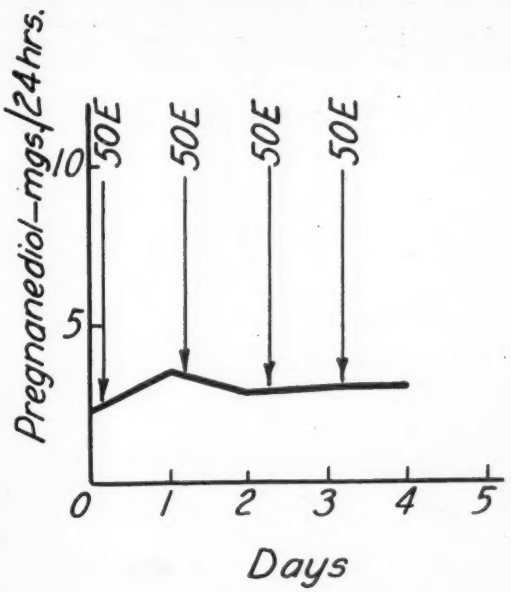

FIGURE I.

Graph of the pregnanediol excretion of non-pregnant women, which showed no increase after the ingestion of 50 milligrammes of ethisterone daily.

extraneous substances. Sometimes the extraneous material is charred by the concentrated sulphuric acid and leads to falsely high colorimetric results. Such effects might account for the variation in daily assays reported by these workers.

The discrepancy in the pregnanediol excretion obtained by Coyle *et alii* when they precipitated the pregnanediol in the toluene residue, first from alcohol as in the Somerville, Gough and Marrian method (1948), and secondly from acetone, could be explained as follows. The final product in pregnanediol assays consists of several progesterone derivatives, and might more accurately be called "pregnanediol complex". The final residue from the alcoholic extract probably contains fractions not present in the acetone extract. Both colorimetric and gravimetric results were higher from the alcohol solution in Coyle's paper. Provided the same method is used for the control curve and for all of the specimens assayed in any series investigated, the final conclusions should be very similar.

Brown, Henry and Venning (1939), Michie (1953) and Alder and Krieger (1957) have shown that there is a very wide range of pregnanediol excretion in normal pregnant women. For this reason the assessment of progesterone deficiency by determining the pregnanediol excretion is difficult. It is our contention that miscarriage, which occurs in women whose pregnanediol excretion is at or above the average normal level, is probably due to causes other than progesterone deficiency. The lower the excretion level the greater is the likelihood of the occur-

rence of miscarriage. In order to provide a working standard, a critical-level curve has been constructed by averaging the pregnanediol values which fell below the average normal at each week of pregnancy in the normal pregnant women tested by Alder and Krieger. Treatment was aimed at maintaining the pregnanediol excretion above the critical level and as near as possible to the average normal level.

In the graphs presented in this paper the upper smooth curve represents the average pregnanediol excretion for normal pregnant women and the lower smooth curve shows the critical level.

Response to Ingestion of Ethisterone.

The pregnanediol excretion of non-pregnant women did not increase after the ingestion of ethisterone (Figure I), but that of pregnant women was significantly increased (Figures II, VII, IXA and IXB, X and XI). A decrease in pregnanediol excretion after the reduction of ethisterone dosage was another characteristic feature of the excretory

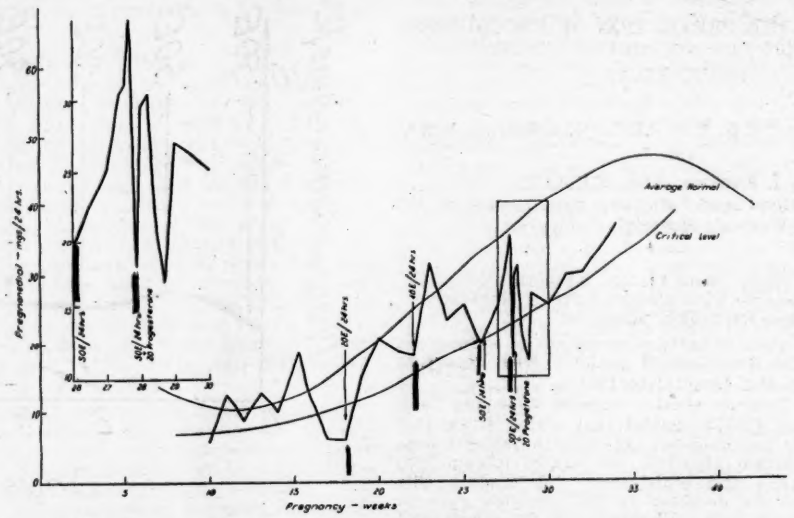

FIGURE II.

Graph of the pregnanediol excretion during the pregnancy (in 1952) of a woman with a previous history of an abortion at 12 weeks in 1946; a full-term baby (five milligrammes of "Proluton" weekly) in 1947; abortions at 16 weeks and six weeks in 1949; an abortion at 26 weeks (blood loss from 18 to 26 weeks) in 1951.

curves of pregnant women (Figures III and X). In some patients the decrease was followed by a rapid recovery to the previous level without further therapy. This effect has been termed "natural recovery" (Figure III).

Although patients with a history of recurrent abortion may be given ethisterone empirically, pregnanediol excretion tests are necessary to determine when the amount of ethisterone needs to be increased (Figure IV). Without such control increased ethisterone may not be given until too late to prevent failure.

Pregnanediol Excretion Curves of Patients who Aborted.

Among 27 patients who aborted in spite of ethisterone therapy, the pregnanediol excretion curves followed three general trends, namely little response to ethisterone, a sharp fall preceding abortion and response yet abortion occurred. (i) In six patients the pregnanediol excretion could not be raised by ethisterone and abortion occurred (Figure V). (ii) In 11 patients initial responses to ethisterone treatment were followed by sharp decreases which frequently indicated impending death *in utero* (Figures VIA, VIB, VIC). In some patients sharp decreases preceded premature labour (Figure VII). (iii) Ten patients responded to ethisterone therapy yet aborted. In five the pregnancy was maintained for periods of 17 to 31 weeks with the pregnanediol excretion at the average normal level or well above it (Figure VIII). In the other five the pregnanediol excretion fell in spite of what were regarded as adequate amounts of ethisterone for the period of pregnancy. It rose in response to increased dosage, but abortion ensued (Figures IXA and IXB).

Pregnanediol Excretion Curves of Progesterone-Deficient Women who Responded to Treatment and had Successful Pregnancies.

The pregnanediol excretion curves of progesterone-deficient patients successfully treated with ethisterone were of four types. (i) The pregnanediol excretion was readily maintained near the average normal level in some patients. Small increases in ethisterone were sufficient to maintain the pregnanediol excretion between the critical and average levels with a constant upward trend as the pregnancy progressed (Figures XA and XB). (ii) The pregnanediol excretion was difficult to maintain above the critical level in other patients who responded to ethisterone but who required larger and more frequent increases in ethisterone to maintain the pregnanediol excretion above the critical level (Figure XI). (iii) "Staircase graph" was the term used to describe the pregnanediol excretion curve in some patients in whom the pregnanediol remained constant for several weeks with the same dose of ethisterone. As the normal curve rises steeply, it was necessary to increase the ethisterone at intervals to maintain a constantly rising curve (Figure XII). (iv) "Swinging graph" was used to describe another type of pregnanediol excretion curve. In spite of a marked response to ethisterone, the excretion could not be maintained in certain patients. Increasing amounts of ethisterone had to be given at weekly intervals in order to keep the pregnanediol excretion above the critical level and approximating to the average normal one. Figure XIII illustrates the swinging type.

Discussion.

A study of pregnanediol excretion curves reveals six ways in which divergence from the normal curve indicates progesterone deficiency. (i) In early pregnancy the pregnanediol excretion is sometimes as low as that found in non-pregnant women. If the level fails to rise after the ingestion of ethisterone, patients will have a threatened abortion, as indicated by blood loss *per vaginam*, or will suffer a complete abortion. (ii) Sudden unexpected falls in pregnanediol excretion with recovery before ethisterone could be increased were at first thought to be due to technical errors. Duplicate tests showed the decreases to

be real. Although several patients had no clinical symptoms, some admitted to an emotional disturbance at the time of the decreased excretion. Vasomotor spasm temporarily causing a deficient utero-placental circulation appears to be a feasible explanation in these cases and in those of uterine cramp or colic which will be discussed in a later section. (iii) In some pregnancies, which terminated in frank abortion or fœtal death, the pregnanediol excretion fell, sometimes sharply and sometimes gradually, to the level found in non-pregnant women. Increasing amounts of ethisterone neither arrested the fall nor raised the pregnanediol level. Pathological examination

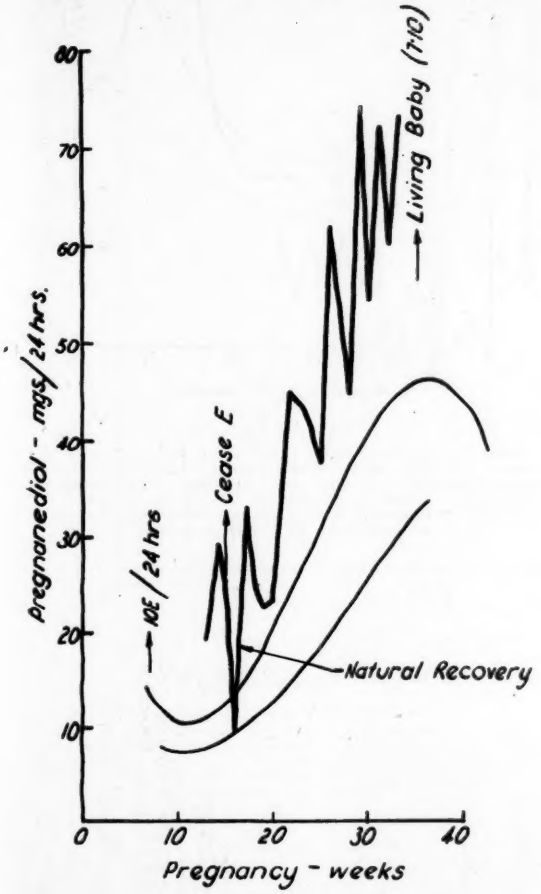

FIGURE III.

Graph of the pregnanediol excretion of a pregnant woman showing a decrease after the reduction of ethisterone dosage followed by a rapid recovery to the previous level without further therapy (natural recovery). This pregnancy (in 1954) resulted in a living baby. The patient had a past history of abortions at 22 weeks in 1948 and 1949, and an abortion at 12 weeks in 1952.

of the placentæ has not disclosed any particular variation of cellular elements. (iv) In patients in whom, after a sudden fall, the pregnanediol excretion recovered to the normal level gradually or more rapidly with ethisterone treatment, there may be a placental thrombosis. The remainder of the placenta then assumes the role of the whole. This hypothesis may account for cases of threatened abortion with recovery, ante-partum hæmorrhage with recovery and some of the patients in whom relatively small doses of ethisterone have resulted in a mature pregnancy and a living baby. (v) In another group the pregnanediol excretion falls to very low levels and can be raised and maintained only by large doses of ethisterone and pro-

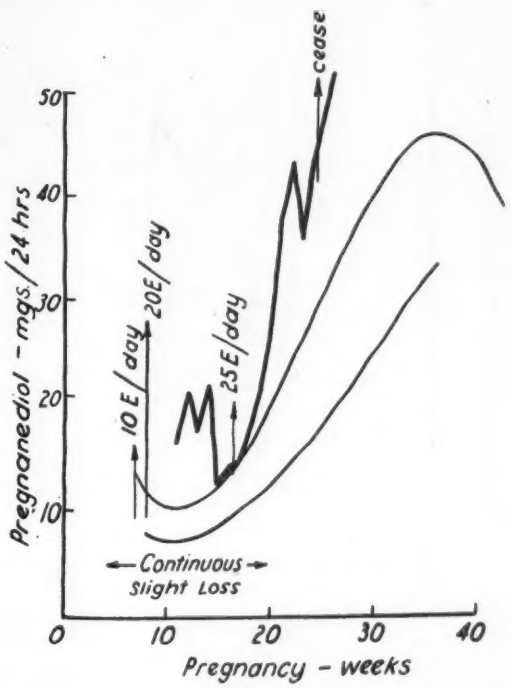

FIGURE IV.

Pregnanediol excretion curve during the pregnancy (in 1953) of a patient with a past history of two abortions: 1947, abortion at 13 weeks; 1948, abortion at 16 weeks; 1948, full-time stillborn baby; 1950, Smith and Smith treatment with pregnanediol tests. This patient was given ethisterone empirically, but pregnanediol excretion tests are necessary to determine when the amount of ethisterone needs to be increased.

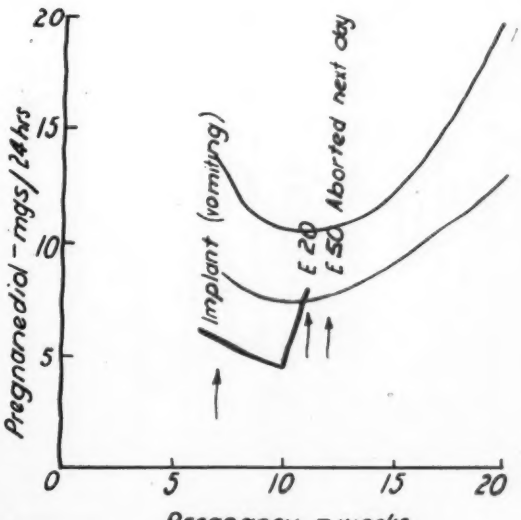

FIGURE V.

Graph of the pregnanediol excretion of a patient in whom the pregnanediol excretion could not be raised by ethisterone and abortion occurred. She had a past history of full-time pregnancies in 1940, 1942 and 1944; and of abortions at 12 or 13 weeks in 1945, 1947, 1948, 1950 and 1951.

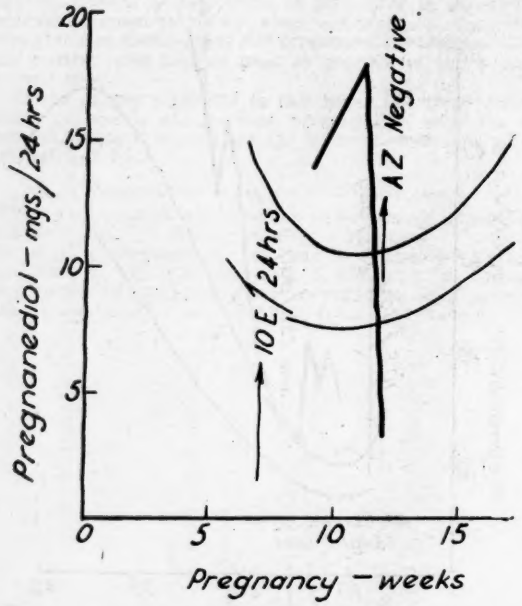

FIGURE VIA.

Graph of the pregnanediol excretion during the pregnancy (in 1954) of a patient with a previous history of full-time pregnancies in 1946 and 1948, abortions at eight weeks in 1951, 1952, 1953 and 1954. The initial response to ethisterone treatment was followed by a sharp decrease and by abortion.

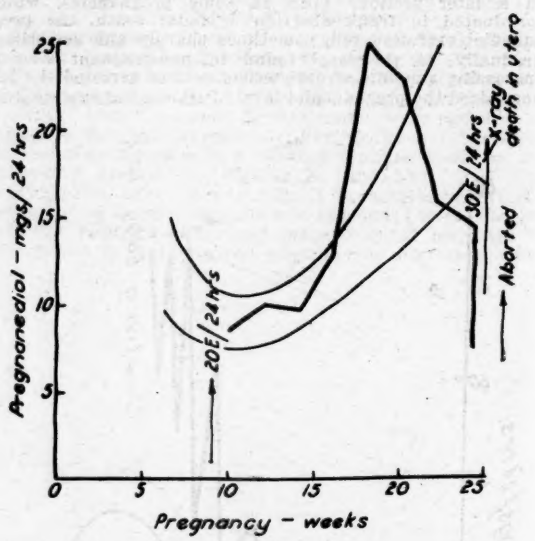

FIGURE VIC.

Graph of the pregnanediol excretion during the pregnancy (in 1953) of a patient with a history of full-time pregnancies in 1940 and 1941: abortion at six weeks in 1947 and 1948; an abortion at 12 weeks in 1949; an abortion at 17 weeks in 1950 (pregnanediol excretion said to be normal by Venning curve).

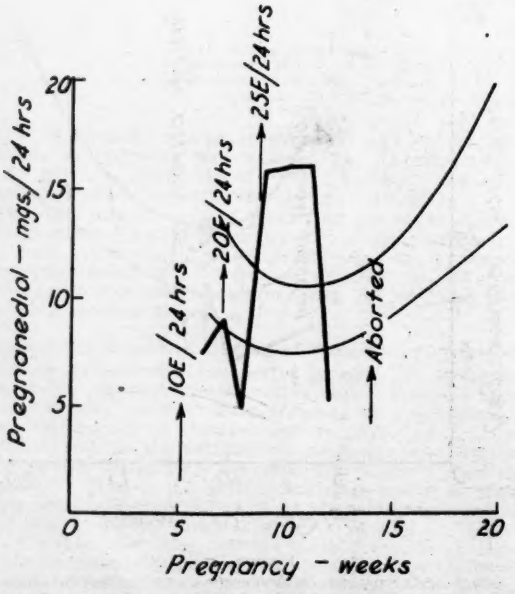

FIGURE VIB.

Pregnanediol excretion curve during the pregnancy (in 1952) of a patient with a history of abortion at 10 weeks and 18 weeks in 1949 and 1950.

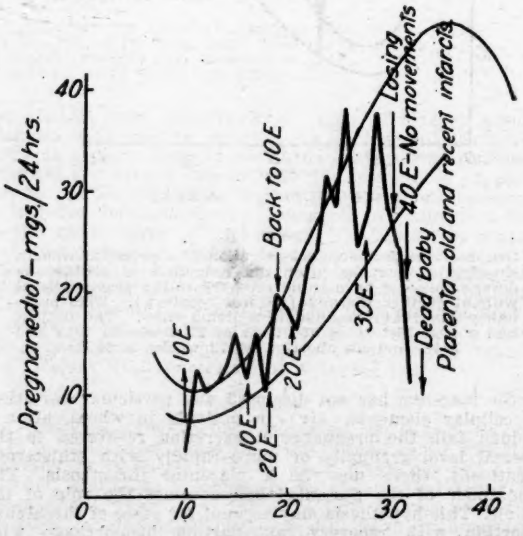

FIGURE VII.

Graph showing increase in pregnanediol excretion after the ingestion of ethisterone by a pregnant woman with the history of abortions at 28 and 30 weeks, followed by the present pregnancy in 1952. The sharp decrease at 30 weeks preceded premature labour and a dead baby.

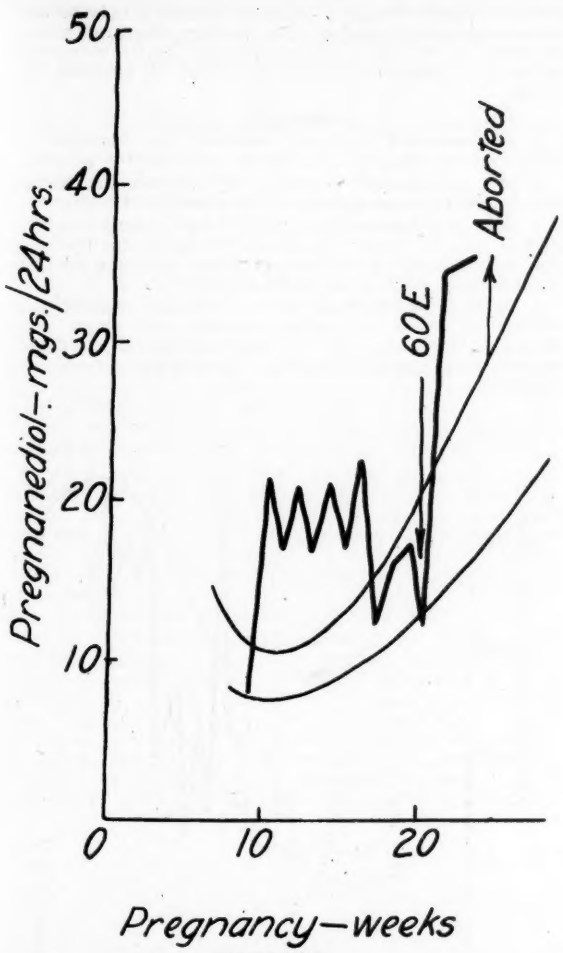

FIGURE VIII.

Graph of pregnanediol excretion of a patient in whom this was maintained at normal levels for 19 weeks, yet she aborted. History of abortions at 24, 10 and 28 weeks in 1948, 1951 and 1952, followed by present pregnancy in 1953. A cervical factor may be involved.

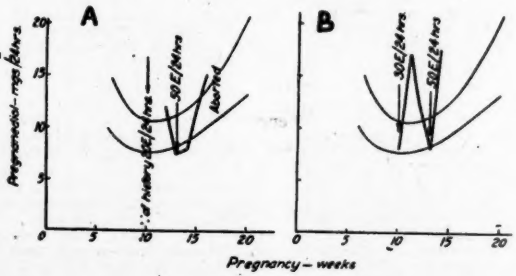

FIGURE IX.

A: Graph of pregnanediol excretion of a patient who had had an abortion at 16 weeks in 1946, a normal full-time baby in 1947, abortions at eight weeks in 1949, 16 weeks in 1950 and 1951, 26 weeks in 1952 and 1953, followed by the present pregnancy in 1954. The pregnanediol excretion fell in spite of ethisterone therapy, rose in response to increased dosage, but sudden abortion of the complete sac with no decidual attachments ensued. B: Graph of pregnanediol excretion of a patient who had had five abortions each at about 10 weeks; the present pregnancy resulted in abortion under similar circumstances to those in Figure IX, A.

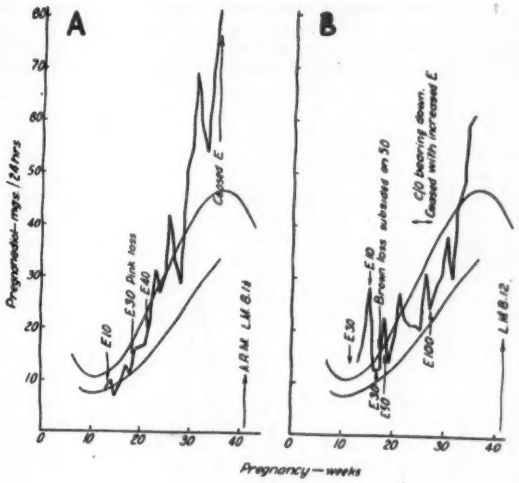

FIGURE X.

A: Graph of the pregnanediol excretion of a patient who had previously had two abortions at 24 weeks; she was readily maintained near the average normal level in the present pregnancy. B: Graph of the pregnanediol excretion of a patient who had a history of one full-term pregnancy and an abortion at 12 weeks; she was readily maintained near the average normal level in the present pregnancy.

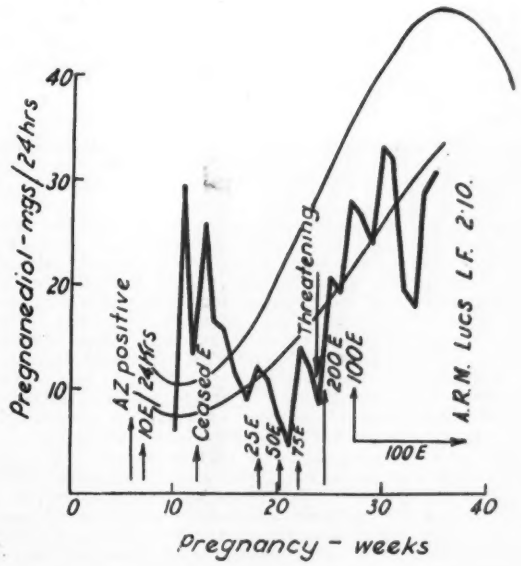

FIGURE XI.

Graph of the pregnanediol excretion of a patient with a history of abortions at six and 10 weeks in 1951 and at 12 weeks in 1952. In the present pregnancy in 1953 the pregnanediol excretion was difficult to maintain above the critical level, so larger and more frequent doses of ethisterone were given, and a baby weighing two pounds ten ounces was delivered at thirty-seven and a half weeks (note placental insufficiency).

gesterone. In these cases it seems logical to assume that there is permanent damage to a large part of the placenta, so that supplementary hormone must be supplied regularly and in large amounts to ensure a successful outcome to the pregnancy. (vi) In several patients the sharp fall in pregnanediol excretion, sometimes to the critical level, with a rise after the ingestion of increased dosage of ethisterone

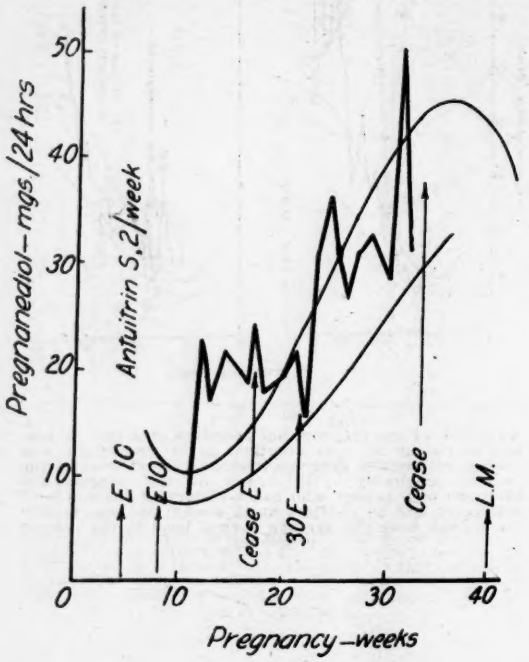

FIGURE XII.

Graph showing the increase of pregnanediol excretion after the ingestion of ethisterone by a pregnant woman who had had an abortion at eight weeks in 1951 and an abortion at 10 weeks in 1952. The present pregnancy (in 1953) resulted in a living baby. This is an example of a staircase graph.

before abortion occurred, could be explained by death of the fœtus prior to that of the placenta. Whilst placental tissue survived, a normal pregnanediol excretion could be maintained.

Sometimes the pregnanediol excretion was normal prior to sudden abortion. Since tests are performed at weekly intervals, a sharp fall could occur in the interval between the collection of a specimen and the day of abortion. In the early stages of the investigation values were reviewed only when the patient returned for the next visit to the clinic. Thus one, two or three weeks might elapse. Results are now reviewed each week, and when significant decreases in pregnanediol are found the clinician is notified immediately so that adequate therapy can be maintained. On the other hand, some of these abortions undoubtedly were due to causes other than progesterone deficiency.

Reference has been made by various authors (Marrian, 1949; Bradshaw and Jessop, 1953; Swyer and Daley, 1953; Coyle *et alii*, 1955) to the fluctuation in the excretion of pregnanediol per 24 hours when daily assays were made. We have observed similar effects in some patients, not only in daily, but also in weekly assays, when there has been no alteration in therapy to account for an increase or decrease in pregnanediol excretion. In a few cases a marked fall in excretion has been followed by natural recovery. However, it has been more frequently observed that such a fall may be the signal for further decreases, leading ultimately to abortion. As abortion may follow closely on the first fall, it appears logical to increase the ethisterone or progesterone immediately, even though a few patients would recover without therapy. Whilst a temporary episode may cause inadequate secretion with recovery when the retarding effect wears off, a progressive and finally permanent failure in progesterone secretion occurs in patients who abort.

Summary.

1. Pregnanediol excretion followed the ingestion of ethisterone by pregnant but not by non-pregnant women.

2. The pregnanediol excretion fell in pregnant women when the ethisterone dosage was decreased or withdrawn.

3. Such decreases could be followed by "natural recovery" without further ethisterone treatment, but frequently abortion or premature labour ensued unless adequate amounts of ethisterone were given immediately.

4. Progesterone-deficient women usually responded to ethisterone treatment. Some required only small doses gradually increasing as the pregnancy progressed. Others needed large and constantly increasing amounts of ethisterone.

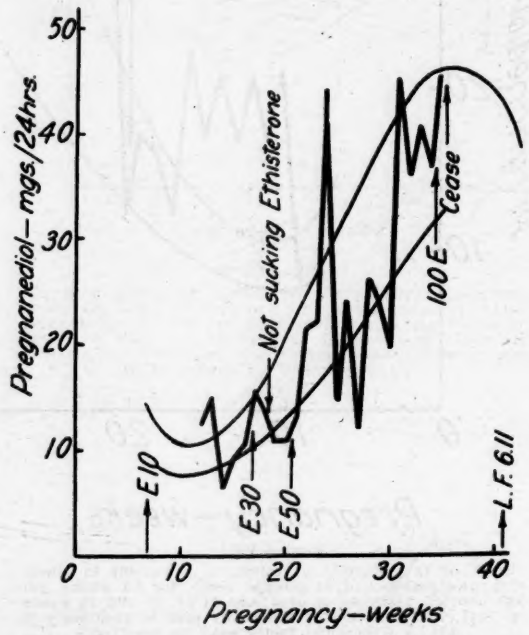

FIGURE XIII.

Graph of the pregnanediol excretion of a woman with a history of abortions at six weeks in 1951, and at 12 weeks and 10 weeks in 1952. The present pregnancy (in 1953) resulted in a living baby. This is an example of a swinging graph.

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STUDIES IN THE PREVENTION OF RECURRENT ABORTION DUE TO CORPUS LUTEUM HORMONAL DEFICIENCY.

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Part II: A Study of the Results of Corpus Luteum Therapy in a Second Series of Patients with Recurrent Abortion.

During the period 1952 to 1954 a second series of patients who had suffered recurrent abortion were treated with corpus luteum hormones, and the results were compared with the 1950 to 1952 series of Alder and Krieger (1957). In the present series there were 90 successful pregnancies (69%) and 40 ending in abortion (31%).

Table I sets out the data relating to primary and secondary abortion, the number of patients who were treated with ethisterone, those who had pregnanediol excretion tests or blood transfusions, the number of mature pregnancies resulting in the birth of living children and the number of abortions in the pregnancies under investigation. All of these patients were treated in a separate clinic and received special care.

Of the 130 patients, 101 were tested for pregnanediol excretion from the earliest week possible until the thirty-fifth week, unless abortion intervened. The other 29 were not tested for the following reasons: some were past the usual danger time when first examined, others were unable to arrange for the regular delivery of urinary specimens and others had exhibited no progesterone deficiency in previous unsuccessful pregnancies. Five of these 29 patients were treated with corpus luteum hormones on clinical grounds such as blood loss, uterine cramps and abdominal pain. These signs and symptoms suggested that progesterone deficiency existed. The remaining 24 were not given hormone treatment.

In this study 34 weeks of pregnancy is taken as the standard of viability, since babies born after this period have a good survival rate. All patients delivered before 34 weeks, whether by early or late miscarriages or by premature labour, even when a surviving child is delivered, are classified as having aborted.

When patients had no living children the recurrent abortions were termed primary consecutive abortions. In patients who had living children as well as having had abortions, only those abortions which followed the last full-time pregnancy were counted, and these were termed secondary abortions. When a pregnancy occurred after a series of abortions followed by a successful pregnancy as the result of ethisterone treatment, patients were classified as "follow-up" cases with the original number of abortions.

Progesterone Deficiency in Relation to Threatened Abortion.

A small group of eight patients who had had no previous abortions was investigated. Six who had threatened abortion with loss *per vaginam* and low pregnanediol excretion in the present pregnancy were treated with ethisterone. Four of these pregnancies proceeded to full term (two of them had placenta prævia), and two aborted. One of the latter was seen at the fifteenth week, when her pregnanediol excretion indicated impending death *in utero*; she failed to respond to ethisterone and aborted in the eighteenth week. The second was investigated from the seventeenth week, when the first bleeding *per vaginam* was observed, until abortion at the thirty-first week. Uterine hæmorrhages recurred at the twenty-first, twenty-third, twenty-sixth and twenty-eighth weeks and thereafter until abortion occurred. Pregnanediol excretion tests between the twenty-third and thirty-first weeks gave results below normal average and at the twenty-eighth, twenty-ninth, thirtieth and thirty-first weeks below the

Table I.

Previous Abortions.	Total Number of Patients.	Number Treated.	Number Untreated.	Recurrent Abortions.				Number of Patients with Pregnanediol Tests.		Results of Present Pregnancies.				Number Given Blood Transfusion.
				Primary.		Secondary.				Mature Living Babies.		Abortions.		
				Treated.	Untreated.	Treated.	Untreated.	Treated.	Untreated.	Treated.	Untreated.	Treated.	Untreated.	
Total Cases Studied.														
0	8	6	2	2	1	4	1	6	2	4	1	2	1 (1)[1]	1
1	19	10	9	6	2	4	7	9	4	9	7	1	2	3
2	39	25	14	14	4	12	9	24	4	17	9	9 (3)	4	4
3	23	20	3	19	0	4	0	20	0	18	3	2 (1)	0	2
4	23	21	2	17	0	0	6	21	0	8	0	14	1 (1)	3
Total ..	112	82	30	59	6	25	22	80	10	56	20	28	8	13
				65		47		90		76		36		
Follow-Up Series.														
1	3	3	0	2	—	1	—	2	0	2	0	1	0	—
2	5	3	2	4	—	1	—	2	1	2	2	1	0	—
3	4	4	0	3	—	1	—	4	0	4	0	0	0	1
4	6	4	2	6	—	0	—	2	0	3	1	1	1	
Grand total	130	96	34	74	6	28	22	90	11	67	23	31	9	14
				80		50		101		90		40 (6)		

[1] Figures in parentheses, over 28 weeks.

critical level. Two pints of blood were given at 28 weeks to restore the falling hæmoglobin level. The placenta showed small and large, old and new, retroplacental clots. The fœtus, though poorly nourished, showed no abnormalities at autopsy.

The other two patients were selected as normal pregnant women when the normal pregnanediol excretion rate was determined. Pregnanediol excretion was low at the eighth and ninth weeks in one patient who aborted during the ninth week. She had previously had two toxæmic pregnancies, each of which carried to term. The other patient had normal pregnanediol excretion and completed a normal full-term pregnancy. The observations on this small group of patients without any history of previous abortions indicate that low pregnanediol excretion is associated with threatened as well as with actual abortion.

Effect of Ethisterone Treatment Irrespective of the Level of Pregnanediol Excretion.

Analysis of all of the pregnancies in this series showed that 67·6% of the untreated patients and 69·8% of the treated ones had mature living babies. These figures do not mean that ethisterone had practically no effect in decreasing the abortion rate, since 90 of the 96 treated patients had progesterone deficiency, as revealed by low pregnanediol excretion. Many of these patients would have aborted if no treatment had been given. Only 11 of the 33 untreated patients had pregnanediol tests, and all of these tests gave normal results. Probably most of the others in the group were also normal in this regard, since they were not a random selection, and included patients whose pregnanediol excretion in a previous pregnancy was normal and others whose pregnancy had proceeded beyond the usual danger time when first examined by us. These results therefore indicate that when no gross progesterone deficiency exists, eitheir naturally, as in the untreated group, or as the result of ingestion of ethisterone, as in the treated group, about 30% of patients again abort. It seems reasonable to assume that these abortions must then have been due to causes others than progesterone deficiency.

Effect of Ethisterone Treatment on Progesterone-Deficient Patients.

In this series (Table II) attention was chiefly focused on the incidence of successful pregnancies among women with progesterone deficiency as revealed by decreased pregnanediol excretion. The results recorded in Table III show that there were 82% living babies to mothers who had had one prior spontaneous abortion, 65% after two, 92% after three and 35% after four or more abortions. There were 67% successful pregnancies for the whole series.

Table III.

Results of Ethisterone Treatment for Progesterone Deficiency in the 1952 to 1954 Series.

Prior Abortions.	Number of Patients.	Number of Abortions.	Number of Mature Pregnancies.
1	11	2	9 (82%)
2	26	9	17 (65%)
3	24	2	22 (92%)
4 or more	23	15	8 (35%)
Total ..	84	28	56 (67%)

The results in the present series are compared with the 1950 to 1952 series in Table IV. In the earlier series the average percentage of successful pregnancies fell from 62% in women with normal pregnanediol excretion to 36% when the excretion was low. Treatment of patients with low pregnanediol excretion resulted in a rise of successful pregnancies to 79% (1950 to 1952 series) and to 64% (1952 to 1954 series), that is a 70% average for the whole group. The percentage increase in successful pregnancies or the "cure" rate after treatment for progesterone deficiency in patients who had had two, three, four or more

Table II.

Previous Abortions.	Total Number of Patients.	Number Treated.	Number Untreated.	Recurrent Abortions.				Number of Patients with Pregnanediol Tests.		Results of Present Pregnancies.				Number Given Blood Transfusions.
				Primary.		Secondary.				Mature Living Babies.		Abortions.		
				Treated.	Untreated.	Treated.	Untreated.	Treated.	Untreated.	Treated.	Untreated.	Treated.	Untreated.	
Effect of Ethisterone Treatment on Progesterone-Deficient Patients.														
0	8	6	2	2	1	4	1	6	2	4	1	2	1 (1)[1]	1
1	13	9	4	5	2	4	2	9	4	8	2	1	2 (1)	3
2	28	24	4	14	1	10	3	24	4	15	1	9 (2)	3	0
3	20	20	0	16	0	4	0	20	0	18	0	2	0	2
4	21	20	1	16	0	4	1	21	0	7	0	14	0	3
Total ..	90	79	11	53	4	26	7	80	10	52	4	28	6	9
Follow-Up Series.														
1	2	2	0	2	0	0	0	2	0	1	0	1	0	0
2	3	2	1	2	1	0	0	2	1	2	1	0	0	0
3	4	4	0	3	0	1	0	4	0	4	0	0	0	1
4	2	2	0	2	0	0	0	2	0	1	0	1	0	0
Grand total	101	89	12	62	5	27	7	90	11	60	5	30	6	10
										65		36		

[1] Figures in parenthesis, over 28 weeks.

TABLE IV.

Comparison of the Proportion of Successful Pregnancies in Patients with Normal Progesterone Levels and in Those with Untreated and with Treated Progesterone Deficiency.

Prior Consecutive Abortions.	Pregnanediol Excretion.														
	Normal.			Low.											
				Untreated.			Treated.								
	1950 to 1952 Series.			1950 to 1952 Series.			1950 to 1952 Series.			1952 to 1954 Series.			1950 to 1954 Series.		
	Total Number.	Successful.		Total Number.	Successful.		Total Number.	Successful.		Total Number.	Successful.		Total Number.	Successful.	
		Number.	Per-centage.		Number.	Per-centage.		Number.	Per-centage.		Number.	Per-centage.		Number.	Per-centage.
2	9	5	56	12	4	33	19	14	74	24	16	67	43	30	70
3	8	6	75	13	5	38	13	10	77	22	20	91	35	30	86
4 or more	9	5	56	3	1	33	15	13	87	23	8	35	38	21	55
Total, 170 cases ..	26	16	62	28	10	36	47	37	79	69	44	64	116	81	70

prior consecutive abortions for each series is set out in Table V. The "cure" rate was estimated by calculating the difference in the number of successful pregnancies between treated (see columns 3, 4 and 5, Table IV) and untreated (see column 2, Table IV) progesterone-deficient patients. Patients who had had four or more prior abortions had the lowest "cure" rate—22%. In those with three prior abortions it was as high as 48%; for the whole group the "cure" rate was 34%.

For the combined series (1950 to 1954), the number of successful pregnancies was much higher in the treated patients after two and three abortions than among those whose pregnanediol excretion was normal. It was of the same order for both groups when patients had had four or more consecutive abortions. Whilst the numbers of patients in each of the subdivisions are too small to allow significant conclusions to be drawn, they indicate interesting trends. The total number of successful pregnancies is doubled in progesterone-deficient women treated with ethisterone.

TABLE V.

"Cure" Rate in Progesterone-Deficient Patients as the Result of Progesterone Treatment.

Prior Consecutive Abortions.	Percentage Increase in Successful Pregnancies.		
	1950 to 1952 Series.	1952 to 1954 Series.	1950 to 1954 Series.
2	41	32	37
3	39	53	48
4 or more	54	2	22
2 or more	43	29	34

The results in this second series confirm the finding in the first series that at least 30% more women who have had two or more consecutive abortions will now have living babies if those with progesterone deficiency are given substitutional progesterone therapy.

Abortion in Spite of Treatment.

Evidence regarding the efficiency of the ethisterone treatment and some clinical observations in the 27 patients who again aborted are correlated in Table VI. In five patients the pregnanediol excretion was normal. These included two in whom the Aschheim-Zondek was never definitely positive, so that the pregnanediol excretion and Aschheim-Zondek tests were at variance; and a third who had twins. It is possible that a higher progesterone level may be necessary in multiple pregnancies. In 11 cases the ethisterone treatment was inadequate, usually through lack of cooperation by the patient. In the other 11 patients who were adequately treated there were three abortions obviously due to other causes, namely one hydatidiform mole, and two in whom complete sacs aborted with no evidence of a fœtus or of decidual attachments. In three patients the pregnanediol excretion could not be raised with increased doses of ethisterone. Of these, two had the "impending death *in utero*" type of curve, and one had toxæmia of pregnancy. Five patients had corrected progesterone levels yet aborted with no apparent cause. Except for a low hæmoglobin level in one of them no other abnormality was observed.

"Cures."

In the (1952 to 1954) series, all of the treated patients were given ethisterone regulated by the pregnanediol excretion. Pending the commencement of tests, prophylactic treatment was given to some of these patients (10 milligrammes of ethisterone per day until 10 weeks, and then 20 milligrammes until 20 weeks). Nine patients who excreted small amounts of pregnanediol in the early part of the pregnancy quickly responded to ethisterone therapy. Six patients with signs of threatened abortion at the usual danger time also excreted smaller amounts of pregnanediol than the normal average at that time. A fall in pregnanediol excretion with onset of symptoms coincided with reduction or cessation of ethisterone in nine patients. In all, 30 patients showed a falling level of pregnanediol excretion (with or without clinical symptoms), which could be corrected by ethisterone. All of these pregnancies proceeded to the birth of mature living babies.

The histories of two patients are given in detail to illustrate the value of adequate treatment with ethisterone and progesterone in preventing early termination of pregnancy.

One patient had had two miscarriages, one at about 20 weeks and another at 25 weeks in 1951; a third pregnancy terminated at six weeks in 1953. Nausea was a characteristic of each pregnancy. The patient had never felt movements.

In the present pregnancy prophylactic ethisterone (10 milligrammes per day) was commenced at nine weeks. This was increased to 20 milligrammes at 13 weeks, since the pregnanediol excretion level was low. At 16 weeks pro-

TABLE VI.

Summary of the Efficiency of Hormonal Treatment and Clinical Observation in Patients Who had a Subsequent Abortion Between 1952 and 1954.

Prior Consecutive Abortions.	Number of Patients Treated.	Number of Abortions.	Pregnanediol Normal.	Ethisterone Treatment for Low Pregnanediol Excretion.			Clinical Observations.
				Adequate.	Inadequate.	Reason.	
1	11	2	—	1 —	— 1	— Patient uncooperative.	Hydatidiform mole.
2	24	8	—	5 —	— 3	— Level in one not increased by clinician.	One low hæmoglobin level. Two low hæmoglobin level.
3	22	2	—	1 —	— 1	— —	Toxæmia. Pregnanediol could not be raised with large and increasing doses of ethisterone. "Staircase" graph; ethisterone raised too late. Failure to anticipate danger.
4 or more	23	15	3 2 —	— — 2 2	— — — — 6	— — — — — Three lack of co-operation.	One, twins; two, other causes. ? Ever pregnant. Aschheim-Zondek and pregnanediol tests anomalous. Complete sac aborted, no apparent decidual attachments. Rapidly falling, "death *in utero*" type of curve. Three regarded as normal—Venning curve, therefore not treated.
Total	80	27	5	11	11		

gesterone injections were substituted for ethisterone, since the pregnanediol excretion had fallen below the critical level. The response was poor, therefore ethisterone was increased to 50 milligrammes per day, and 20 milligrammes of progesterone were given three times a week. A further increase to 100 milligrammes of ethisterone per day was necessary at 20 weeks. An implant of 100 milligrammes of progesterone and an increase of ethisterone to 200 milligrammes were necessary at 23 weeks to alleviate uterine cramps. These had occurred at the danger time in former pregnancies. A blood transfusion was given to correct the falling hæmoglobin level. The treatment was effective and ethisterone was reduced to 100 milligrammes per day at 26 weeks. The pregnanediol was maintained at the normal level until 33 weeks. It then fell rapidly and at 34 weeks had reached the critical level. The patient complained of bearing-down pains. The cervix was dilated and at thirty-five and a half weeks the membranes ruptured. After 38 hours of irregular labour Cæsarean section was performed. A living baby weighing four pounds two ounces was born (Figure I).

This case is typical of this group of patients and illustrates: (i) rises in response to increased doses of ethisterone when the pregnanediol excretion begins to fall; (ii) response to intramuscular injections of progesterone; (iii) associated blood dyscrasia (falling hæmoglobin level) and low pregnanediol excretion at about the danger time; (iv) response to blood transfusion, progesterone implant and oral ethisterone. There was a marked fall in pregnanediol excretion at 35 weeks, followed by recurrence of uterine cramps and contraction with dilation of cervix and rupture of the membranes.

Another patient suffered four abortions, each between the twelfth and sixteenth weeks of pregnancy. In the present pregnancy she reported after 12 weeks of amenorrhœa since curettage for the last abortion. She complained of loss *per vaginam* for 10 days. She was ordered 10 milligrammes of ethisterone per day as a prophylactic measure. At 16 weeks the pregnanediol excretion was at the critical level and she complained of lower abdominal pains, which were immediately relieved by ingestion of 20 milligrammes of ethisterone per day. At 19 weeks there was a red vaginal loss. At 20 weeks vaginal loss recurred and there was lower abdominal pain. The internal os easily admitted one finger. The pregnanediol excretion was at the critical level. She was admitted to hospital. Ethisterone dosage was increased to 30 milligrammes per day. Ten days later the condition subsided, and the os would not now admit a finger. At 28 weeks irregular bouts of low abdominal pain accompanied by slight red loss *per vaginam* recurred. Again the pregnanediol was very low. She was given 40 milligrammes of ethisterone per day and bed rest. The symptoms subsided. At 30 weeks the symptoms recurred, and with a further increase of ethisterone to 60 milligrammes per day these disappeared and the low pregnanediol excretion rose and

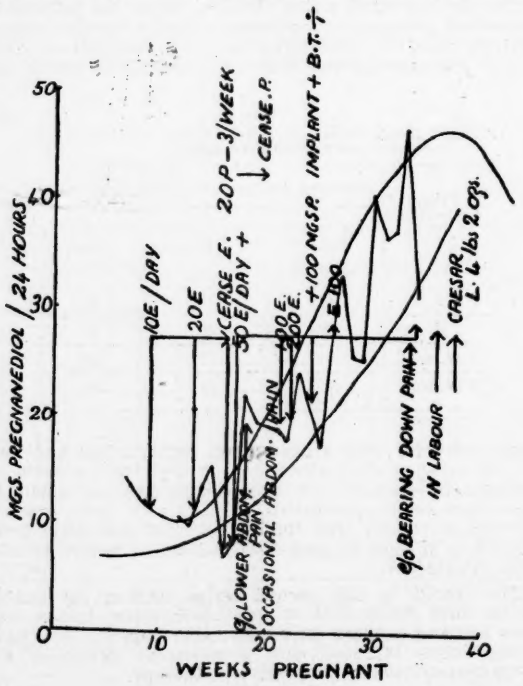

FIGURE I.

continued above the average normal level. At 35 weeks the membranes were artificially ruptured to avoid the possibility of recurrence of ante-partum hæmorrhage if gestation was prolonged. She was delivered of a living baby weighing five pounds one and a half ounces (Figure II).

This was one of the early cases in the series. In the light of subsequent experience it seems that larger doses of ethisterone, e.g. 50 milligrammes per day from 16 to 20 weeks would have been beneficial. This is suggested by the rapid response at 30 weeks. An interesting feature was the commencing dilation of the cervix at 20 weeks, which was arrested by ethisterone treatment.

In the next pregnancy in 1953 this patient did not report until 16 weeks. She was admitted to hospital with ruptured membranes, and inevitable abortion occurred on the same day. This follow-up pregnancy seems to confirm the belief that the corpus luteum treatment was responsible for the successful pregnancy in 1952.

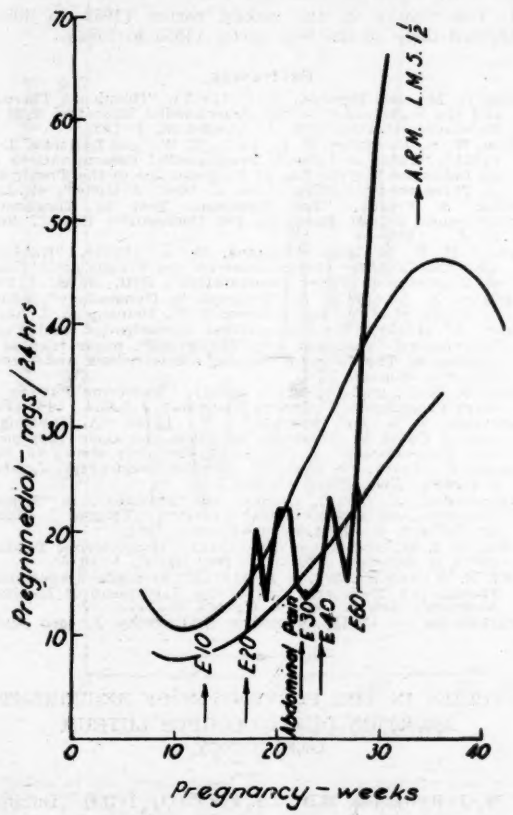

FIGURE II.

Discussion.

Much discussion has centred around the question of salvage rate when patients with a history of habitual abortion have been treated with various vitamins and hormones. Most authors have assessed the value of the therapy investigated by comparison with the spontaneous cure rates calculated by Malpas and Eastman.

Our results may be compared with the spontaneous cure rates published by Malpas (1938), Whitehouse (1955), MacGregor and Stewart (1939) and Eastman (1947). The number of living babies after two prior abortions was 65% (1952 to 1954 series), 70% (1950 to 1954 series) as against 62% (Whitehouse), 50% (MacGregor and Stewart) and 63% (Eastman): after three abortions 92% (1952 to 1954 series), 86% (1950 to 1954 series), as against 27% (Whitehouse), 20% (MacGregor and Stewart) and 16·4% (Eastman): after four or more abortions 35% (1952 to 1954 series), 55% (1950 to 1954 series), against 6% (Whitehouse), 10% (Malpas), 10% (MacGregor and Stewart) and 2% (Eastman) (see also Table VII). There appears to be a substantial increase in the number of successful pregnancies after three or more abortions in our series.

Swyer and Daley (1953) suggest that sampling different populations and comparing the results of the treatment of a condition in one population with the outcome of that condition whether untreated, treated in the same way or in a different way in another population may lead to fallacious results. We have therefore compared the successful pregnancies after two, three and four or more prior consecutive abortions in a group of untreated progesterone-deficient patients with those from patients with normal pregnanediol excretion and from another group of treated progesterone-deficient patients (Table IV). This comparison shows that there is an increase in successful pregnancies in the treated group, the number of living babies being at least equal to the number for patients with normal pregnanediol excretion. This finding is to be expected, since factors other than progesterone deficiency should cause a similar proportion of abortions in those with normal pregnanediol excretion, occurring either naturally or as the result of treatment. A "cure" rate of 34% above the expected "spontaneous cure" rate (36%) was observed in patients who had had at least two consecutive abortions.

TABLE VII.

Comparison of the Spontaneous Cure Rate in Patients with Two or More Consecutive Abortions with the Cure Rate in Treated Progesterone-Deficient Women.

Number of Prior Consecutive Abortions.	Spontaneous Cure Rate (Percentage).				Cure Rate (Percentage) in Treated Progesterone-Deficient Women. Alder, Krieger and Rawlings (1950 to 1954).
	Alder and Krieger Untreated Patients.		Whitehouse.	MacGregor and Stewart.	
	Normal Progesterone Secretion.	Deficient Progesterone Secretion.			
2	43	33	62	50	70
3	52	38	27	20	86
4	50	33	6	10	58

Perhaps the most striking proof of the effect of ethisterone treatment was found in the study of individual patients as their own controls. Pregnanediol excretion of progesterone-deficient patients rose when ethisterone was ingested, fell when it was decreased or withdrawn and again rose in response to further ingestion of ethisterone. Blood loss and abdominal cramps disappeared with adequate ethisterone dosage, and pregnancies resulted in the birth of living mature babies.

In some patients there has not only been a successful pregnancy with ethisterone treatment after two, three and four or more consecutive abortions, but also an abortion has occurred when ethisterone was deliberately withheld in the pregnancy after the successful one.

Study of the literature reveals that there are few records of regular quantitative assays of pregnanediol excretion throughout pregnancy in women treated with progesterone for habitual abortion. Grant (1952) and Bishop and Richards (1952) treated their patients without proof of the existence of progesterone deficiency and used an arbitrary dosage. Swyer and Daley (1953) and also Bender (1948) estimated pregnanediol excretion in the first morning specimen of urine. Baker *et alii* (1955) estimated the sodium pregnanediol glycuronide in twelve-hour specimens of urine. Vaux and Rakoff (1945), and Jones and Delfs (1951) reported series with rational quantitative estimations on the basis of excretion per 24

hours. Only a small number of patients were investigated in the former series.

In our series we have determined the pregnanediol excretion per 24 hours at weekly intervals from the first visit to the clinic until the thirty-fifth week, unless the pregnancy terminated before that time. The cooperation of our patients was very satisfactory, and the twenty-four-hour collections were accurate in the majority of the 5000 specimens assayed. Tests were made in duplicate, since the method is complicated and loss could occur at various stages. Even this series is not large enough to give statistically significant results when subdivided into the cure rate after two, three and four or more prior abortions. However, it does show that, when progesterone deficiency exists, adequate therapy will result in twice as many successful pregnancies as occur without corpus luteum treatment. It is possible that every series will include some patients whose abortions have been self-induced, but it is difficult to exclude a small percentage of such patients even after thorough investigation. However, if the problem is attacked from the point of view of therapy for proved progesterone deficiency, the occasional suspected cases of this kind will not substantially alter the results.

In reports by two groups of workers, the results have been similar to ours. In 1948 Bender studied 100 consecutive cases of threatened abortion. He found that in 38% there was a progesterone deficiency. Treatment of patients with no progesterone deficiency resulted in more abortions than if such patients were not treated. Treatment of progesterone-deficient patients improved the number of successful pregnancies, and only 14% aborted, whereas 75% aborted if treatment was withheld. Analysis of the over-all figures showed no improvement in the number of successful pregnancies. He explained this as being due to increased abortions caused by treating patients with no progesterone deficiency, balancing the decreased number of abortions resulting from treatment of progesterone-deficient patients. However, by subdividing the patients according to progesterone need and treating only those with low pregnanediol level, the abortions were reduced to 18%.

In 1951 Jones and Delfs studied 74 pregnancies in women who had had three or more consecutive abortions. The patients were divided into three groups: A, those who were progesterone-deficient and received adequate treatment; B, those who were also progesterone-deficient, but had no treatment; C, those who showed no hormonal deficiency and were not treated. In the progesterone-deficient group, the treated ones had 85% successful pregnancies, whilst in the untreated group only 22% were successful. In the untreated normal hormone group, there were 50% successful pregnancies.

The results in these two series are similar to ours except that Bender's observation of abortion due to the continuation of ethisterone treatment after the pregnanediol excretion had been restored to normal was not confirmed. Therefore, since there does not appear to be any serious risk of producing adverse effects by over-dosage, we suggest the following empirical dosage when pregnanediol excretion tests cannot be obtained.

(a) When previous abortions have occurred prior to 16 weeks: 25 milligrammes of ethisterone daily until 12 to 14 weeks; 50 milligrammes of ethisterone daily until 20 weeks; after 20 weeks no further treatment unless signs or symptoms develop.

(b) When previous abortions have occurred after 16 weeks: from 21 weeks treatment is continued with 50 or 100 milligrammes of ethisterone daily until 34 weeks.

In either case, should symptoms arise, the ethisterone dosage may be doubled and/or supplemented with 25 milligrammes of progesterone daily. It must again be stressed that this empirical treatment will be adequate in some patients, but in others the amount of hormone needed can be gauged only by the pregnanediol excretion level. With empirical treatment, critical levels may be missed and abortion will occur.

Summary.

1. Between 1950 and 1954, 116 progesterone-deficient patients with a history of recurrent abortions were studied; 81 (70%) had a successful pregnancy when treated with ethisterone (first series, Alder and Krieger, 1950 to 1952—79%; second series, Rawlings and Krieger, 1952 to 1954—64%).

2. There were twice as many successful pregnancies in treated as compared with untreated progesterone-deficient patients with a history of recurrent abortion.

3. Abortion recurred in 33% in the 1952 to 1954 series. More than half of these abortions were due to inadequate treatment. Others were proved due to "other causes". No explanation could be found for 5%.

4. The results in the second series (1952 to 1954) confirmed those of the first series (1950 to 1952).

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STUDIES IN THE PREVENTION OF RECURRENT ABORTION DUE TO CORPUS LUTEUM DEFICIENCY.

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PART III: A STUDY ON PROGESTERONE DEFICIENCY IN RELATION TO ABDOMINAL PAIN AND UTERINE CRAMPS PRECEDING ABORTION.

DURING pregnancy the uterus undergoes regular rhythmic contractions which are not brought to the conscious level. With the onset of labour these contractions become more powerful, until the temporary ischæmia of the muscles raises the reaction to the conscious level as shown by the onset of pain. In certain types of incoordinate uterine action these contractions are very painful but ineffective, due to non-polarity of the uterus.

Smith and Smith have shown that progesterone withdrawal precedes the onset of normal labour, and claim that a similar progesterone withdrawal occurs before premature labour. This work suggested an investigation into the association of progesterone insufficiency with

abdominal discomfort and conscious hardening of the uterus, often over a period of days, prior to premature rupture of the membranes.

In the 1952 to 1954 series, a special study was made of patients who had a history of recurrent abortions and who complained of uterine cramps. Some of the early patients were found to have a low pregnanediol excretion before or at the actual time of occurrence of the pain. These patients reported that ethisterone and progesterone

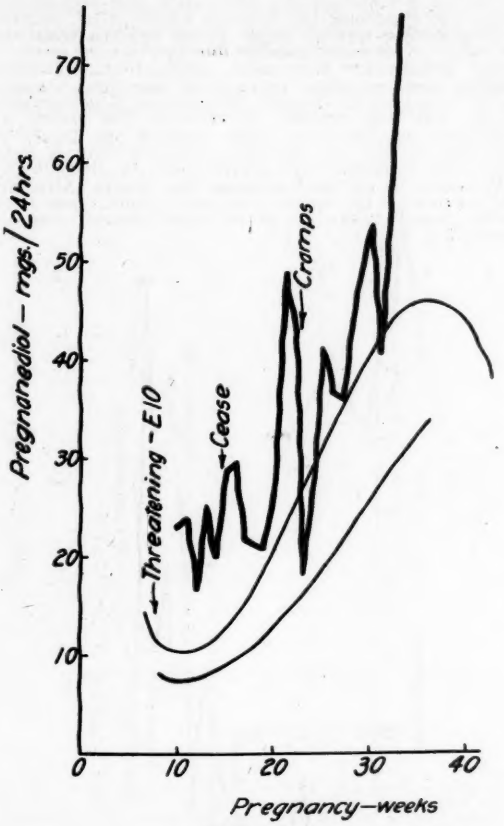

Figure I.

Graph of the pregnanediol excretion of a patient with a past history of a full-term pregnancy (pre-marriage) in 1947, and abortions at eight weeks in 1952 and 1953 (different father). During the present pregnancy in 1953 she was given ethisterone before the onset of uterine cramps because the pregnanediol excretion was low.

afforded quick relief of their symptoms. The occurrence of abdominal pain, described by patients as "green-apple tummy-ache", without diarrhœa, a feeling of pressure on the pelvic floor as though the vulva was opening, or an actual tightening and cramping of the uterus (symptoms rather similar to those in dysmenorrhœa), was noted in 25 of the 1952 to 1954 series of patients. These 25 patients included 19 who had had two or more primary abortions, four who had had two or more secondary abortions and two who had had repeated abortions preceding a full-term pregnancy and then an abortion after it.

Abortion had occurred between 16 and 26 weeks in the earlier pregnancies of most of these patients. It is interesting that 20 of these patients proceeded to full term, and only five of them again aborted in the pregnancy under review. The abortions occurred at 16, 18, 24, 26 and 27 weeks respectively. Fifteen of these patients were given ethisterone treatment before the onset of uterine cramps because the pregnanediol excretion was low (Figures I, II, III, IV) or as a therapeutic measure before tests could be performed (Figure V). In 12 of them the pregnanediol excretion was low immediately before (Figure I) or at the actual time of occurrence of pain (Figures II, III, IV).

Fourteen of the patients given ethisterone regulated by pregnanediol excretion again had uterine cramps, but they occurred at a later time than in earlier pregnancies. The preventive action of ethisterone is best illustrated by two patients, each observed in two pregnancies. In the first of these pregnancies both had low pregnanediol excretion and uterine cramps. In one, the cramps were accompanied by slowly progressive dilation of the cervix. Both were treated with small doses of ethisterone and both aborted. In their next pregnancies the patients were treated with larger doses of ethisterone to maintain a normal pregnanediol excretion. Both patients had living full-term babies.

Ethisterone and progesterone treatment was discontinued in one patient at 27 weeks, since her pregnanediol excretion was normal and the clinical condition was good. Immediately afterwards the pregnanediol excretion fell and uterine cramps ensued;

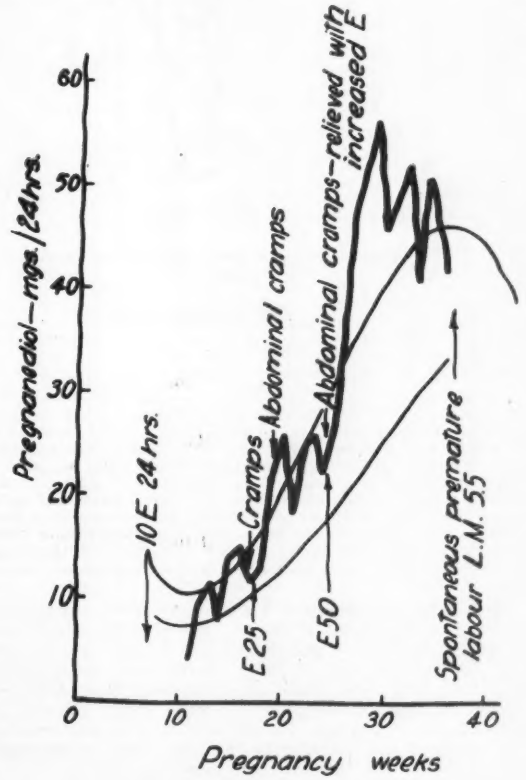

Figure II.

Graph of the pregnanediol excretion of a patient who had had an abortion at 20 weeks in 1950, a premature delivery with a living baby at 34 weeks in 1951, and the premature delivery at 25 weeks in 1952 of a baby weighing one pound eight ounces who died. In the present pregnancy she was given ethisterone because the pregnanediol excretion was low and she was suffering from abdominal cramps.

200 milligrammes of ethisterone relieved the uterine cramps, but the pregnanediol excretion could not be raised above the critical level. Continuation of this high level of treatment maintained the pregnanediol excretion at the critical level until 35 weeks. A living baby was born at term.

The histories of two of the patients whose pregnanediol excretion graphs are used in this paper are included to illustrate the various relevant observations.

CASE I.—The patient had a past history of abortions at 16 weeks and 12 weeks in 1952 and 1953 after a full-time pregnancy in 1949. She was first seen in the present pregnancy in 1954 in the special clinic at 24 weeks, and complained of lower abdominal pains similar to dysmenorrhœa for about half an hour every morning for one week. She was ordered buccal ethisterone 50 milligrammes per day, and the pains were relieved. Her hæmoglobin level was 76%. This was raised to 86% after transfusion of one pint of blood. The results of the pregnanediol excretion tests at 25 and 26 weeks were

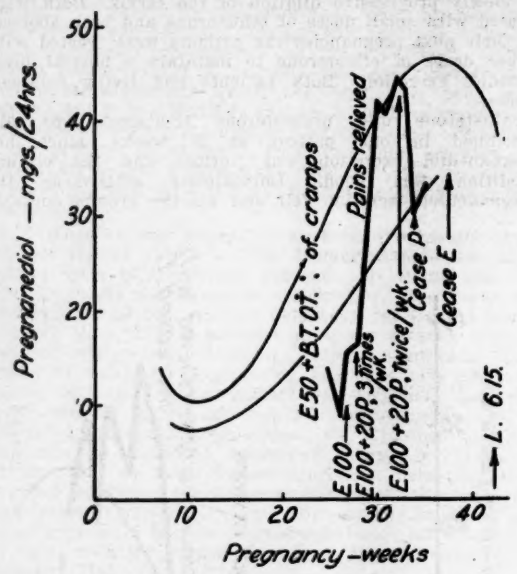

FIGURE III.
Graph of the pregnanediol excretion of the patient in Case I.

below the critical level. Since an increase in ethisterone to 100 milligrammes per day did not raise the pregnanediol level, she was given one injection of 20 milligrammes of progesterone in addition to the ethisterone. She reported after 28 weeks with a recurrence of period pains for three days. The 100 milligrammes of ethisterone per day were supplemented with 20 milligrammes of progesterone three times per week. The spasms were relieved, and the pregnanediol excretion rose to the average normal level (Figure III).

This history illustrates: (i) uterine cramps associated with a low hæmoglobin level; (ii) immediate relief by buccal ethisterone supplemented by blood transfusion; (iii) recurrence of cramps with low pregnanediol excretion; and (iv) relief of symptoms with increased corpus luteum therapy coincident with a rise in pregnanediol excretion. In this series four patients had this combination of uterine cramps, low pregnanediol excretion and low hæmoglobin concentration.

CASE II.—The patient had had abortions at 22 weeks in 1951 and 1952. Pre-natal examinations showed no evident causative factor. In the present pregnancy in 1953 pregnanediol excretion tests were commenced at eight weeks. The values were above the normal average, but with a gradually falling tendency. By 16 weeks the pregnanediol excretion had fallen to below the critical level. Treatment with 25 milligrammes of ethisterone per day produced a gradual rise. Just before collection of the specimen at 20 weeks the patient complained of backache and abdominal pain. She was instructed to take a further 25 milligramme tablet of ethisterone, and the symptoms were immediately relieved. At her next visit the cervix was closed and the uterus slack, but she complained of some backache similar to that with dysmenorrhœa. The pregnanediol excretion remained at the average normal level, although the patient continued to complain of backache and a feeling of cramp after micturition. The urine was clear in repeated microscopic examinations. Progesterone ("Lutocyclin", 10 milligrammes) was administered prophylactically during the twenty-first and twenty-second weeks and discontinued after the test at 22 weeks. The excretion fell suddenly to the critical level at 25 weeks, although the cramps were less intense. The ethisterone was increased to 75 milligrammes per day immediately after collection of the twenty-sixth week's specimen. Although the pregnanediol excretion rose to normal, uterine cramps recurred. The ethisterone was reduced to 50 milligrammes per day and was supplemented with 10 milligrammes of progesterone three times per week. The patient volunteered the information that the injection relieved the symptoms for about 36 hours. After 30 weeks the progesterone was no longer given, and the ethisterone was raised to 40 milligrammes per day. At 32 weeks no further ethisterone was given, since the pregnanediol excretion was very high. Immediately there was a marked drop in pregnanediol excretion. Ethisterone, 25 milligrammes per day, was then ordered. At 34 weeks the patient was comfortable, but the cervix easily admitted one finger. The ethisterone therapy was therefore continued until 36 weeks, when it was decreased to 25 milligrammes on alternate days. At 38 weeks the os easily admitted two fingers. After artificial rupture of the membranes and a quick, easy labour a living female baby (six pounds eight ounces) was born (Figure IV).

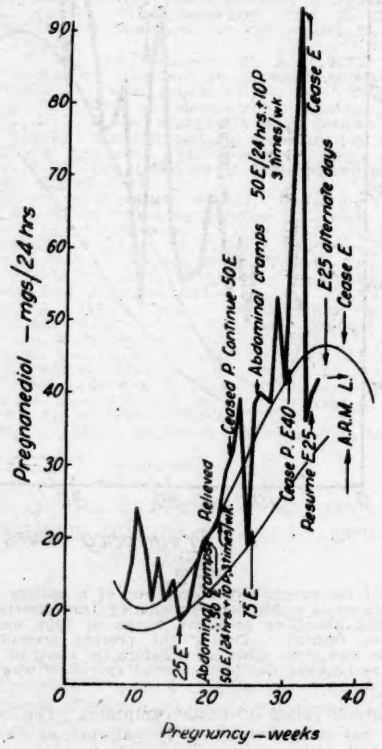

FIGURE IV.
Graph of the pregnanediol excretion of the patient in Case II.

This history demonstrates: (i) progesterone deficiency at 16 weeks with slow recovery with ethisterone therapy; (ii) abdominal cramps occurring at 21 weeks—the usual danger time; (iii) at 21, 26 and 30 weeks the supplementing of 50 milligrammes of ethisterone with progesterone did not increase the pregnanediol excretion; (iv) the clinical evidence that 10 milligrammes of progesterone relieved the uterine cramps for 36 hours; (v) the rapid fall in pregnanediol excretion when no further ethisterone was given; (vi) with resumption of a decreased amount of ethisterone from 35 to 36 weeks, the cervix quietly dilated to two-fingers width.

Discussion.

The results reported in this paper show that uterine cramps are frequently associated with a fall in the excretion of pregnanediol. Treatment with ethisterone and/or progesterone results in relief of pain and a rise in pregnanediol excretion. In some patients there is also a decrease in the blood hæmoglobin level, and blood transfusion is beneficial in alleviation of the symptoms.

In our earlier series Alder stressed the number of patients with the os cervicis dilated and the membranes bulging. In the present series this has been observed only in patients with a falling pregnanediol excretion, which had not been corrected sufficiently early by adequate corpus luteum therapy. The effect of corpus luteum hormone seems to be similar to that of a sedative inhibiting excessive Braxton Hicks contraction of the uterus.

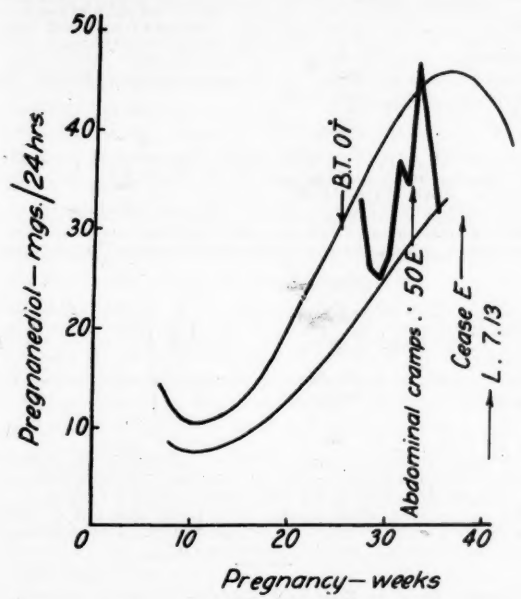

FIGURE V.

Graph of the pregnanediol excretion of a patient with a previous history of a full-term baby in 1944 and an abortion at 10 weeks in 1953. During the present pregnancy in 1954 she was given ethisterone as a therapeutic measure before tests could be performed, and because she had abdominal pain.

As shown in Part I, sudden falls in pregnanediol excretion may be associated with emotional disturbance. In many instances a decreased pregnanediol excretion and rapidly falling hæmoglobin level are associated with uterine contractions or non-polarity of the uterus. These observations suggest that psychological reactions may engender vasomotor spasm of the uterine vessels or muscles, with resulting ischæmic cramp and perhaps interference with blood supply. Progesterone secretion may thus be decreased. On the other hand, the first effect may be decreased secretion of progesterone, and this may produce the uterine cramps.

These suggestions do not explain the relief of uterine cramps by corpus luteum hormone in patients who have no progesterone deficiency, that is in whom the pregnanediol excretion is normal.

Acknowledgements.

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Reviews.

Australia in the War of 1939-1945. Series 2 (Navy). Volume I: "Royal Australian Navy, 1939-1942", by G. Hermon Gill; 1957. Canberra: Australian War Memorial. Sydney: Angus and Robertson, Limited. Obtainable at all booksellers. 9¼" × 6", pp. 704, with many illustrations. Price: 30s.

THE author modestly states that this volume tells "briefly" the story of the Royal Australian Navy and of Australian naval policy between the wars, and then records the part played by the ships and men of the Navy on every ocean and particularly in the eastern Mediterranean and the Indian and Pacific Oceans from 1939 until the end of the first quarter of 1942. Including appendices, but excluding the index, the book is of 652 pages, and may be considered a most comprehensive and detailed account of the Royal Australian Navy during the period stated. A second volume will appear later to tell the story of the Royal Australian Navy in the last three and a half years of the war. Numerous illustrations and maps add to the interest of the book, and a very thoroughly compiled index covering some thirty-two pages provides for ready facility in reference.

Each unit of the R.A.N. is mentioned so many times that it is impossible to discuss any but the more striking events which happened during the present period under review. However, it is significant to note that, in accordance with the Navy's tradition of being always ready for emergency, R.A.N. ships were on the alert on the high seas on the first day of the war.

During the Western Desert campaign, the part which *Stuart, Vampire, Vendetta, Voyager* and *Waterhen* played is of great interest. The "Tobruk Ferry Service" and the magnificent heroism of the men in these ships in keeping Tobruk functioning make them immortal. The narrative then proceeds vividly to the stirring days of Greece, where the ships of the Navy performed great deeds in the face of punishing attacks.

Nearer home there is much to claim our attention. A very fine map shows the progress of the Battle of Matapan on March 28 and 29, 1941, in which H.M.A.S. *Perth* participated. The brilliant exploit of H.M.A.S. *Sydney* in destroying the Italian cruiser *Bartolomeo Colleoni* in July, 1940, is well illustrated by a map showing *Sydney's* track chart off Cape Spada, Crete. Later in the volume, the loss of H.M.A.S. *Sydney* in November, 1941, makes sad reading. Also, the battle of the Java Sea on the night of February 28-March 1, 1942, tells of the last hours of H.M.A.S. *Perth*, when this cruiser fought so valiantly against overwhelming odds. The final moments of H.M.A.S. *Yarra*, which was sunk south of Java on March 4, 1942, reveal heroism of the highest order.

All seas of the world were seen by H.M.A.S. *Australia*, and her part in the Dakar expedition is of interest. The engagement of H.M.A.S. *Canberra* with two German ships in the Indian Ocean, in which both these ships sank, brings to mind the hunt for the German "pocket battleship" *Admiral Scheer*. The adventurous stay of the cruiser H.M.A.S. *Hobart* in the Red Sea area in 1940, her sojourn in the Mediterranean in 1941, and her service in the Singapore-Java area in early 1942 are all similarly described in detail. *Hobart* was in Suez Bay on July 13, 1942, when *Georgic* was set on fire by German bombers. H.M.A.S. *Parramatta* received an eulogy from Admiral Cunningham for her splendid work in the Eastern Mediterranean in 1941, but was unfortunately torpedoed and lost in November of that year.

Much space is given to the description of the important task of convoying by R.A.N. ships in all oceans of the world. The reader will need to traverse a great part of the book to get the full story of the dull but vital task of the convoys, full of danger also.

In the volume's last chapter, called "Prelude to Victory", the narrative runs along with the withdrawal of all ships from the Java area. A review of the general state of the war early in 1942 is given, and future strategy is discussed, with the lessons of the immediate past to be learned. An important point made is the unity of purpose with which Churchill and Roosevelt acted. "There is no use giving a

single further thought to Singapore or the Dutch Indies", Roosevelt wrote to Churchill on March 18, 1942, "they are gone—Australia must be held, and we are willing to undertake that . . . You must hold Egypt, the Canal, Syria, Iran, and the route to the Caucasus". Further comment is that "The fumbling period of ABDA (American-British-Dutch-Australian) was over; the period of positive and united participation had begun".

The last paragraphs of the volume could not be bettered:

> The Navy had entered that first phase in September, 1939, small in numbers of ships and of men, with little more than the tradition of actual sea battle, but well trained and efficient. They emerged from that phase poorer in the loss of fine ships and men, but rich in the knowledge of their task and themselves; proved in the fire of actual experience of war at sea, and stronger in numbers both of ships newly built and men newly trained to man them. They were assets which would stand both Navy and Nation in good part on the hard road to victory.

It is regretted if in this short review the deeds of valiant ships and men have not been adequately praised. The volume is so full of detail and description that the remaining task will be for the reader. Should he undertake this, he will be well repaid.

How to Write Scientific and Technical Papers. By Sam F. Trelease; 1958. Baltimore: The Williams and Wilkins Company. 7¼" × 4¾", pp. 200, with illustrations. Price: 35s. 9d.

THIS volume is stated to be the outgrowth of two earlier books, the first of which appeared in 1925. The result is an exhaustive treatise bearing the mark of experience. The author deals not only with the literary and technical aspects of writing a paper, but also with the preceding matters of choosing and dealing with a research problem. The medical writer will find a good deal of detail that does not much concern him, as the book is intended for a wider audience, but this need not distract him from the mass of useful information and sound advice offered. The price of the book is rather high to attract the individual casual writer, but every medical library should have a copy.

Principles of Immunology. By John E. Cushing and Dan H. Campbell; 1957. New York, Toronto, London: McGraw-Hill Book Company, Incorporated. 9" × 6", pp. 358, with 16 illustrations. Price: $6.50.

THE field of immunology has long been concerned with the response of the body to foreign material, particularly micro-organisms which are potentially pathogenic. The greater part of work in this field has been to measure and interpret the significance of the antibody response to infection, and this is still true. However, it has been realized that immune mechanisms are of general importance to fundamental biology, and this is the theme of "Principles of Immunology".

The opening chapter is a general survey of some fundamental principles. This is followed by the main part, which deals with biological immunity. In this, one finds such subjects as the genetic control of antigenic structure, a discussion on the use of blood group antigens in the study of human populations, and study of antigenic differences in defining taxonomic relationships in other species. This leads to a consideration of antigenic individuality, which has its medical application in tissue transplantation. Natural antibodies and hæmagglutinins and immunity in the absence of antibodies are described in a wide range of species, and a chapter on comparative immunology shows the wide field covered by this book. The opening chapter is a general survey of some fundamental principles involved, while the last third of the book deals with the nature of antigens, antibodies and their reactions.

This book is intended to give a student of biology a general background of the principles of immunology. The preface states that "very little medical immunology is discussed, and laboratory procedures are only given where they may aid in clarifying a certain basic problem". As complementary reading to a book dealing more extensively with medical problems, this book has a considerable value, as it would broaden the outlook of many pathologists.

One obvious criticism is that the authors have tried to do too much. They have mentioned a large proportion of the interesting, but as yet unexplained, phenomena of immunology, but have not placed them in their proper perspective, nor have they given any idea of their relative importance. Extensive use of small print for pieces of information which cannot at present be used to illustrate principles would have made the book more valuable to those with no previous experience in this field.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"Atlas of Tumor Pathology (Washington: Armed Forces Institute of Pathology)." Section 1—Fascicle 2: "Tumors of the Skin", by Herbert Z. Lund, M.D.; 1957. 10¼" × 7¾", pp. 232, with 235 illustrations. Price: $3.00. Section 5—Fascicle 20: "Tumors of the Esophagus", by Arthur Purdy Stout, M.D., and Raffaele Lattes, M.D.; 1957. 10¼" × 7¾", pp. 108, with 103 illustrations. Price: $1.00. Section 7—Fascicle 25: "Tumors of the Liver and Intrahepatic Bile Ducts", by Hugh A. Edmondson, M.D.; 1958. 10¼" × 7¾", pp. 220, with 207 illustrations. Price: $2.25.

Further additions to an outstanding series of publications.

"The Medical Assistant: A Guidebook for the Nurse, Secretary, and Technician in the Doctor's Office", by Miriam Bredow; 1958. New York, Toronto, London: McGraw-Hill Book Company, Inc. 9" × 5¾", pp. 448, with many illustrations. Price not stated.

The author is Dean of Women, Eastern School for Physicians' Aides, New York.

"Official Year Book of Queensland, 1957, No. 18", compiled by S. E. Solomon; 1958. Brisbane: A. H. Tucker. 8½" × 5½", pp. 462. Price not stated.

An attempt is made to present "all the most important and valuable statistics of the State with that necessary minimum of comment which is required for understanding the figures".

"John Wesley Among the Physicians: A Study of Eighteenth Century Medicine", by A. Wesley Hill, B.A., M.B., B.Ch.; 1958. London: The Epworth Press. 7¼" × 4¾", pp. 146. Price: 10s. 6d. (English).

An account of Wesley's medical activities against the contemporary medical background.

"A Short History of Anatomy from the Greeks to Harvey", by Charles Singer; 1957. New York: Dover Publications, Inc. 8" × 5", pp. 226, with many illustrations. Price: $1.75.

An unabridged republication of a book now out of print, the original title of which was "The Evolution of Anatomy".

"Human Blood in New York City: A Study of its Procurement, Distribution and Utilization, Conducted by the Committee on Public Health, New York Academy of Medicine, under the Direction of its Subcommittee on Blood Survey"; General Director of Study, H. D. Kruse, M.D.; 1958. New York: The New York Academy of Medicine. 8½" × 5", pp. 148. Price not stated.

The title is self-explanatory.

"Renal Circulation in Acute Renal Failure", by Ole Munck, M.D.; 1958. Oxford: Blackwell Scientific Publications. 9" × 5½", pp. 54. Price: 12s. 6d. (English).

A monograph based on investigations carried out at the third department of the Copenhagen Municipal Hospital and the Cardiovascular Laboratory, Medical Department B, Copenhagen University Hospital.

"Autonomic Dyspraxia: An Hypothesis for the Mechanism of Psychosis, Neurosis and Psychosomatic Disease", by Brian G. Haynes, M.B., B.S., M.R.C.P.; 1958. London: H. K. Lewis and Company, Limited. Sydney: Angus and Robertson, Limited. 8½" × 5½", pp. 132. Price: 28s.

The author is a Sydney physician.

"The Liver and its Reactions in Africa", published by the Medical Graduates Association and the Students Medical Council of the University of Witwatersrand, Johannesburg; 1958. 9½" × 7¼", pp. 48, with many illustrations. Price not stated.

This consists of Numbers 2, 3 and 4 of Volume 27 of the journal *The Leech*.

The Medical Journal of Australia

SATURDAY, OCTOBER 25, 1958.

AUSTRALIA AND THE COLOMBO PLAN.

AUSTRALIA has perforce reorientated itself considerably in the last generation or so, especially towards the neighbouring countries of Asia. This has resulted partly from Australia's own growth towards maturity, with a resultant increasingly important role in international affairs, and partly from the great stirring that has gone on in Asia itself. Ancient peoples, casting aside alien domination or the lethargy of centuries, have developed what are in effect new nations, anxious to be accepted and reckoned with in the world at large. We, a latter-day people springing from British and European soil, find ourselves growing side by side with the young-old nations of Asia. Geographically and in other ways our national life and future are bound up with theirs. This being so, it is important for us to realize that in many ways they are not as well off as we are, and that we are in a position to do something about it. If the idealism which is part of our national heritage is not enough to move us to appropriate action, lesser motives of expediency and self-interest may still make us heed the words of a distinguished Asian statesman, the late Liaquat Ali Khan of Pakistan:

> It is my conviction that the peace of the world today depends on the peace of Asia. You cannot allow one third of the world to live in misery, and hope that the world at large will live in peace.

As R. G. Casey has said in a book which every Australian should read,[1] we can no longer live in the "state of comfortable anomaly" in which we looked almost entirely to Europe, ignoring the changed international scene; "we are a European community living alongside and working with Asia".

One constructive way in which this situation has been recognized by the Australian Government is in the Colombo Plan. It is the subject of a chapter in R. G. Casey's book, which can be consulted with advantage for further details, but its essence is this. The countries of South and South-East Asia have tremendous social and economic problems, and until these are in some practical measure solved, the people will continue to suffer and their countries will remain restless and potential sources of unrest to their neighbours and the world in general. Under the Colombo Plan, the more highly developed participating countries have pledged themselves "to assist the countries of South and South-East Asia by contributing both resources and the benefit of their acquired skills and knowledge" so that the living standards of the people may be raised. This Casey fittingly describes as "a great new experiment in international democracy involving aid with no thought of a *quid pro quo*". Australia was a prime mover in the proposal for the Colombo Plan, which was born in Colombo in January, 1950, at a conference of Foreign Ministers of Commonwealth countries—Britain, Canada, Australia, New Zealand, India, Pakistan and Ceylon. It was recognized from the start that the economic interests of all the countries of South and South-East Asia were involved; and one by one, as they realized that the plan was "a genuine co-operative effort without political strings", other countries joined in—Burma, Indonesia, Nepal, the Philippines, Thailand, Cambodia, Laos, Vietnam and, more recently, Japan. The United States brought its great financial resources into the plan in 1951. The Colombo Plan is essentially concerned with cooperative economic development, the greatest problem to be solved being food production. It has two main parts: first, the Technical Cooperation Scheme, which is concerned with the training of students, the provision of experts, and the provision of technical equipment to research institutes, universities and similar institutions; second, the Economic Development Programme, which is mainly concerned with aid to public investment projects such as irrigation, power, communications, railways, roads and other basic services.

In the first of these Australia has played an important part. It is impossible to live in any of our capital cities without realizing that there are a great many Asian students with us, and this, quite as a side-line, has probably done much to cement Australian-Asian understanding on the personal level. R. G. Casey states that well before the end of 1957, Australia had received 2000 Colombo Plan students from Asian countries, as compared with the mid-1957 figures of 1500 in the United Kingdom, 600 in Canada and 375 in New Zealand. In addition, in the spirit of the Colombo Plan, but not under its official provision, there are in Australia nearly 4000 private students from Asia and the Pacific region. A Correspondence Scholarship Scheme sends from Australia courses in skilled trades, technical professions and accounting and clerical work. In the provision of experts to advise and teach, Australia has also done a good deal; over 200 such experts have gone to South and South-East Asia so far. Considerable quantities of technical equipment also have been supplied. In the Economic Development Programme, Australia was pledged to provide aid to the value of over thirty-one million pounds in the original six-year period of the Plan, and by the end of 1956 approximately twenty-eight million pounds had been spent or committed.

In the specific fields of health, nursing and social welfare, Australia's contribution under the Colombo Plan has been significant. This has included the training of students and nurses, the supply of equipment and the provision of experts. Training, either completed or still in progress, has been provided for 300 nurses (including post-graduate nurses), 43 medical students, one physiotherapist, 22 radiographers, 10 dentistry students (including post-graduate students), 10 post-graduate students in medicine and 22 others (pharmacy, clinical work, dispensing, blood transfusion). Major items of equipment supplied have included a hospital launch to India for use in the Andaman and Nicobar Islands (£54,315), equipment for the Welisara

[1] "Friends and Neighbours", by R. G. Casey, 1958, Michigan State University Press, East Lansing, Michigan, U.S.A.

Tuberculosis Hospital in Ceylon (£23,015), an X-ray unit for the University of Ceylon (£4110), horses for serum production (£22,080) and equipment for hospitals (£9800) in Thailand, refrigerators for hospitals in Laos (£3200), equipment for pathology laboratories in North Borneo (£1905), equipment for Safdarang Hospital in India (£510), laboratory and training equipment for Liaquat Medical College in Pakistan (£175) and training equipment for a graduate nursing school in Burma (£100). Australia has also under the Development Programme provided Ceylon with £500,000 for the construction of anti-tuberculosis clinics and £100,000 for an Institute of Hygiene. A total of 137 experts in medical and health fields have been supplied, including 37 medical specialists on short assignments. Particularly important has been the contribution to the fight against tuberculosis. In Ceylon the erection of anti-tuberculosis clinics has been made possible, and from early 1954 to the end of 1957 a team of Australian nurses taught at the Welisara Tuberculosis Hospital, from which 105 nurses graduated (including some from Malaya and Nepal). In Malaya a team of Australian nurses has been maintained at the Lady Templar Tuberculosis Hospital, and it is hoped that, when the present team leaves at the end of 1959, Malaya, like Ceylon, will be able to continue the instruction of the nurses. An Australian team, under the leadership of Dr. Cotter Harvey, of Sydney, left Sydney in June of this year to assist with a mass X-ray survey for tuberculosis in Singapore. Two teams of lecturers and examiners have gone to Singapore in connexion with the Primary Examination for Fellowship of the Royal Australasian College of Surgeons—with gratifying results. In 1956 a small party of medical teachers visited Indonesia to assist in assessing the potentialities and the needs of medical schools in that country. These have all made a most valuable contribution to the impact of the Colombo Plan, especially from the point of view of goodwill. In this regard we may note the informed comment of Charles Gamba[1] on the Asian reaction to the Colombo Plan:

> The answer must be qualified. The Plan has done a great deal of good—more in goodwill than in terms of economics or by expanding technical knowledge. . . . The amounts needed to raise the standard of living in Asia, even by a mere two per cent., are far greater than many Colombo Plans put together could possibly provide. Nevertheless, the Plan, when related to the individual, has been an instrument of mutual understanding *at the personal level.*

Gamba goes on to refer to the difficulty of reconciling, before Asian eyes, the idealism of the Plan with certain other political attitudes and actions relating to defence, and his comments provide much food for thought. However, a medical journal is not the place to discuss purely political issues; the medical contribution has been constructive and acceptable and should be maintained in the fullest measure.

Commenting on the Plan as a whole, R. G. Casey points out that the Australian contribution towards the development programme is only a small part of the total aid being sent to South and South-East Asia. Even the large sums provided by all the donor countries together with the International Bank represent only a fraction of the funds needed to carry out the development programmes of the free Asian countries. He goes on:

> The vast bulk of the effort—in physical as well as financial terms—comes from the domestic resources of the Asian members of the Colombo Plan. External aid only supplements the resources contributed by the recipient countries in providing equipment and skills not found in the area. It is related to specific projects and particular needs, and aims only at supplying those elements essential to development schemes which recipient governments cannot themselves provide.

The Colombo Plan is not charity; nor is it just a crutch. It is perhaps best understood in terms of the modern concept of rehabilitation—the provision of such training, encouragement and temporary aid as will enable the recipient to find sufficiency in his own resources. There is no place in it for patronage or sterile pity. It is a cooperative effort.

[1] *Australian Quarterly*, 1958, 30:24 (September).

Current Comment.

HISTAMINIC CEPHALGIA.

A somewhat uncommon but not really rare syndrome which has been attracting much attention lately is histaminic cephalgia. Particular reference may be made to two long papers giving detailed accounts of this condition. One of these, by Sir Charles Symonds, is labelled simply "A Particular Variety of Headache".[1] The other, labelled "Histaminic Cephalgia", is by B. W. Robinson.[2] Between them these two papers cover the history, symptomatology, treatment and causation of the condition.

Partial descriptions of the syndrome have been given in a number of papers from 1867, but the earlier accounts mostly described it as a form of migraine. In a series of papers from 1937 B. T. Horton and his co-workers have given detailed accounts of the condition, which have served to draw attention to it. The patient is usually an adult complaining of brief recurrent unilateral headaches of great severity, present chiefly at night and accompanied by lachrymation in the ipsilateral eye and stuffiness of the ipsilateral nostril, sometimes with rhinorrhœa. Most of the patients are males. There seems to be no family history of the condition. A point which has been recognized only comparatively recently is that the attacks come in clusters. Usually there are long symptom-free periods punctuated with headache clusters. The duration of the clusters is on the average about two weeks, but may extend to twelve weeks, and they appear up to six times per year, averaging twice. The attacks occur two to four times per day and last from five minutes to eight hours. They appear most commonly at night, tending to recur at the same time each night. The pain is very severe, burning or boring; it appears quite suddenly and disappears just as suddenly. Eye symptoms, other than ipsilateral conjunctival injection and increased lachrymation, are rare. The pain is mostly referred to the orbital region, but may involve the hemicranium and the face and is nearly always unilateral. A positive response to the histamine provocative test is pathognomonic of the condition. In this test about 0·35 milligramme of histamine base is injected subcutaneously between attacks, but within a cluster. A positive response consists of the development of pain, approximately 30 to 60 minutes after the injection, identical in character and location with the pain of a spontaneous attack. Frontal headaches occurring within three to five minutes after the injection, not accompanied by eye and nasal signs, are neglected. Only about 60% of patients give a positive response. If the condition is thought of during examination of a patient with severe headache, the diagnosis is not usually difficult, and a positive response to the histamine test settles it. A negative response to the histamine test is of no importance. One has to differentiate the condition from migraine, but this is not usually difficult. Other types of headache can usually be differentiated without trouble.

[1] *Brain*, 1957, 79:1.

[2] *Medicine*, 1958, 37:161 (May).

There is a large amount of evidence to show that the symptoms and signs of the condition are secondary to vasodilatation in the branches of the external carotid artery. This is indicated by the fact that, if it is treated early, the pain can be completely abolished by vasoconstrictors such as epinephrine, ergotamine, cold air or water. Pressure over the carotid artery will sometimes bring about dramatic relief. What part, if any, histamine takes in the causation of the headaches is far from clear. Horton suggested that the patient had, by some manner, developed a local hypersensitivity to histamine, but neither Robinson nor Symonds believes that this is true; they consider that other agents may also cause vasodilatation. It is impossible with the evidence available to give any causation for the condition.

Following Horton most of the treatment has been in the direction of histamine desensitization by the injection of gradually increasing doses of very dilute histamine solution. The effects of long-term treatment cannot be assessed in a condition in which the attacks occur in clusters of short duration with long intervals between. Symonds has introduced a method of treatment which appears to be very suitable. Considering the clock-like regularity of the attacks, he anticipates the timing of the attacks and gives ergotamine intramuscularly. Thus, if the attacks in a cluster are nocturnal, the dose is 0·5 milligramme given intramuscularly every night at bedtime. If attacks occur both nocturnally and diurnally, another 0·5 milligramme is given on arising. After a week the injections are stopped, but they are resumed for another week if the attacks recur. Robinson agrees that this is the best treatment at present available.

FROM JUNK HEAP TO MUSEUM.

"In England Now", contributed by peripatetic correspondents of *The Lancet*, is medical journalism at a high level. With humour and understanding the hopes and fears, the failings and the problems of doctors and patients, as well as their respective families, are ruthlessly exposed. There must be few subscribers with such dead souls that they do not turn to this column in *The Lancet* before resolutely, perhaps resignedly, turning to more serious, although often perhaps less important, material contained in the opening pages. It is, of course, an essential element of good journalism of this kind that one should recognize oneself or, for the less introspective, one's own problems, from time to time.

One matter recently discussed is reported[1] as comedy, but like much that is truly funny it is dangerously close to tragedy. It concerns a doctor who wished to dispose of grandfather's medical junk, which had gathered the dust of years while cluttering up the attic. After superficial inspection the secondhand dealer's casual offer was 17s. 6d. for the lot. The offer was accepted, whereupon the dealer identified, amongst the heap of old iron and for the benefit of his ignorant client, two bullet extractors and a tourniquet of the Napoleonic era, a carbolic spray inscribed for Professor Lister by J. Gardner, instrument maker of Edinburgh, and a silver vaccination set of original Jennerian design. No doubt there were other trivial little bits of junk which, as the dealer observed, the museums and the private collectors would fight over.

Sad cases of this kind pass almost wholly unrecorded in medical literature. Most collectors, of course, have bitter memories of "the one that got away" (and depressingly often from reputable institutions too), but in most instances the morbid matter is excised and cast into the incinerator, so that no diagnosis can ever be made. In Australia this insidious disease causes more serious destruction than in England, where for many years there have been eager collectors, numerous local museums and a greater awareness of the past in all sections of the community. Indeed, it is highly unlikely that an Australian secondhand dealer would recognize medical museum pieces for what they are, so that even at an inflated price they will never reach museums or collectors. Finally, the store of medical instruments of yesteryear in this country is necessarily small, and almost any loss is irreparable.

The condition is easily treated. By all means empty the attic, the cellar, the bottom drawer and the rotting trunk in the garage; but do not carelessly dispose of the contents, however valueless they may appear. The history of medicine in Australia, if it is to be authentically preserved and accurately recorded, requires all sorts of old apparatus and spare parts, ranging from diagnostic instruments to stethoscope clips for top hats—in fact, almost anything. It also requires more manuscript material, diaries and letters, and many more of those ephemeral paper-covered pamphlets which have mostly escaped, if indeed they were ever captive, from our libraries. Only the expert can decide what can be disposed of, and there is at least one of these in most of our capital cities. In Victoria, the British Medical Association, as the Medical Society of Victoria, has established a museum which is systematically collecting, filing and displaying manuscript material and old medical instruments, more particularly those of Australian significance. There is urgent need to further this work before rust, silverfish, mildew, human fallibility and similar destructive influences have completed their evil task.

The Lancet's peripatetic correspondent drowned his remorse in a cup of black coffee. It is highly desirable that we should translate remorse into action, or at least take heed of the lesson. The attic will have to be cleaned some day.

[1] *Lancet*, 1958, 1: 960 (May 3).

DIABETES AND TUBERCULOSIS.

H. Silwer and P. N. Oscarsson[1] have investigated the incidence of diabetes and of tuberculosis and the conditions for their coincidence in patients in the Swedish county of Kristianstadt, which has a population of about a quarter of a million inhabitants. To enumerate the diabetics, they searched hospital records, examined the roll of recipients of free insulin and circulated a *questionnaire* among the medical practitioners. As a result, estimates of prevalence were made of 4·6 for males, 5·7 for females or 5·1 for persons per 1000. These figures can be compared with some extensive tabulations of other surveys of diabetic incidence, which are given in their Table I. In Kristianstadt county there appears to be little difference in incidence between town and country. At younger ages the sexes are equally affected, but with increasing age the females are the more heavily affected. This increasing incidence of the females has been a subject of some speculation, but the same finding has been reported by P. Stocks[2] from a number of countries where the males were more heavily affected in the nineteenth century. However, these Swedish sex differences are not as marked as some American or Australian differences reported by Lancaster[3] and by Lancaster and Maddox.[4]

Over half of the Swedish diabetics were more than 50 years old when the disease was first detected. In childhood insulin was being used in every case, but at ages about 70 years insulin was being used in only 62% of cases, for, in a proportion of elderly persons, the diabetes takes a very mild form. Tuberculosis appeared to be more common among the severer and younger diabetics. It seemed to occur as a complication of the diabetes, which was in almost every case well established before the tuberculosis was manifest. The tuberculosis was more common, the longer the diabetes had persisted. All diabetics should therefore have regular X-ray examinations of the chest for tuberculosis.

A feature of Silwer and Oscarsson's monograph is an extensive bibliography of historical and geographical interest, especially strong in its references to continental authors.

[1] "Incidence and Coincidence of Diabetes Mellitus and Pulmonary Tuberculosis in a Swedish County", by Hans Silwer and Per Nanne Oscarsson; *Acta medica scandinavica*, Supplementum 335; 1958. 9¼" × 6¾", pp. 48, with illustrations.

[2] *J. Hygiene* (Cambridge), 1944, 43: 242.

[3] M. J. Australia, 1951, 1: 117.

[4] *Australasian Ann. Med.*, 1958, 7: 145.

Abstracts from Medical Literature.

RADIOLOGY.

Angiographic Studies in Cerebral Atherosclerosis.

M. TATELMAN (*Radiology*, June, 1958) discusses a survey of the angiographic findings in 200 patients admitted to hospital with a diagnosis of "stroke" or cerebral vascular accident. These patients were studied by combined clinical, neurological and radiographic methods. In addition to the more commonly described occlusions of the internal carotid and middle cerebral arteries, the relative frequency of occlusions of the vertebral-basilar artery system and of the anterior cerebral artery is stressed. The angiographic appearance of cerebral atherosclerosis without occlusion is described and the importance of such findings is indicated. Complete occlusion of the internal carotid artery was encountered in 10·5% of these patients, of the anterior cerebral artery in 7·5%, of the middle cerebral artery in 4·5%, and of the vertebral-basilar arteries in 2·5%. Partial occlusion of the internal carotid artery was found to be the cause of "stroke" symptoms in 10% of patients. The narrowing produced by the plaque is almost always seen immediately distal to the origin of the internal carotid artery and may show a varied X-ray picture—usually an eccentric filling defect in the lumen, most often with a broad base but sometimes having an appearance simulating a flap-valve or less often seen as a symmetrical narrowing of the vessel. The importance of such a finding is emphasized by the fact that a few of these patients returned after several months or more with complete occlusion of the internal carotid artery at the site of the atheromatous plaque. Such an outcome might be averted in many cases by proper surgical removal of the disease process. Less striking findings of atherosclerosis may be seen, but only with careful study of all the vessels visualized on cerebral angiography. These are often overlooked because of the small calibre of the vessels but, once appreciated, are found with ever-increasing frequency. There is no doubt that such observations are of great significance even when there is no complete occlusion present. Minor changes of atherosclerosis in the cerebral vessels are similar to those found in arteries elsewhere in the body, namely irregularity in vessel lumen with or without narrowing, dilatation, abnormal tortuosity, straightening and elongation of vessels. Slight irregularity in the lumen is found most often in the internal carotid artery just beyond its origin and in the area of the carotid siphon. These changes are usually quite localized, whereas the changes in the intracerebral branches tend to be more generalized or involve longer segments of the vessels. Atherosclerotic changes in the vertebral and basilar arteries are often quite striking, dilatation and elongation of the basilar artery in particular being not uncommon. It is considered that elongation of the basilar artery to a point significantly above the posterior clinoid processes should arouse suspicion of atherosclerotic change even when no narrowing, dilatation or irregularity is present. In all, 58% of these patients showed some manifestation of atherosclerosis. The author emphasizes the importance and relative safety of angiographic evaluation in cases of "stroke syndrome".

Peptic Œsophagitis.

B. S. WOLF, R. H. MARSHAK AND M. L. SOM (*Am. J. Roentgenol.*, May, 1958) state that peptic œsophagitis, usually of mild degree, is frequently present in association with a hiatus hernia of the direct variety. The X-ray findings in such cases may be minimal. In the presence of a duodenal ulcer or excessive gastric acidity and hypersection for some other reason, or as a result of intubation and operative intervention under general anæsthesia, peptic œsophagitis of severe degree involving a considerable portion of the distal part of the œsophagus may occur and may result in marked stricture formation. A group of patients exists in whom a variable length of the distal part of the œsophagus is lined by an atypical, embryonic or heterotopic (Barrett) type of epithelium. This type of epithelium is susceptible to inflammation and ulceration, presumably under the influence of acid gastric juice regurgitated from a hernial sac of true stomach. An ulceration in such a gastric-lined segment of œsophagus may resemble an ordinary chronic peptic ulcer as seen in the stomach. In the absence of an inflammatory complication, the presence of a gastric-lined segment of the œsophagus is not recognizable by X-ray methods and may be overlooked at œsophagoscopy. When discrete ulceration and/or stenosis is observed by these methods at some distance above a typical hernial sac, the presence of a gastric-lined segment should be suspected. In such cases, the exact location of the ulceration or stricture, i.e. whether it lies within the gastric-lined segment or immediately above this segment in a normally lined part of the œsophagus, must be determined by microscopic examination. In the presence of a direct hiatus hernia, peptic ulceration of discrete nature may occur in and be localized to the terminal portion of the œsophagus without diffuse involvement of the lower part of the œsophagus and independently of gastric hyperacidity. When discrete ulceration is present in the terminal portion of the œsophagus in association with a hiatus hernia, the possibility that a Barrett type of epithelium may be present must be kept in mind since (i) ulceration may occur at the lower margin of the gastric-lined segment, and (ii) the terminal portion of the œsophagus may be lined by a mixture of squamous and Barrett type of epithelium for a short distance immediately above the true stomach.

Pulmonary Hypertension.

E. F. VAN EPPS (*Am. J. Roentgenol.*, February, 1958) states that cardiac catheterization is an expensive, time-consuming method of estimating the pressure in the pulmonary arterial tree and is not without its inherent danger to the patient. A systematic study of the trunk of the pulmonary artery, its major and peripheral divisions, and the rapidity with which the more peripheral vessels attenuate, will enable the radiologist to estimate within limits the pulmonary artery pressure. The radiographic findings in pulmonary hypertension are the same regardless of the cause, i.e. whether it is primary pulmonary vascular disease or secondary to such conditions as mitral stenosis, congenital heart disease with left to right shunts, pulmonary emphysema, multiple pulmonary emboli, etc. Pulmonary hypertension has been classified into an active and passive category. Passive hypertension is the result of increased auricular and pulmonary venous pressures, associated with only mild to moderate increase in pressure in the pulmonary artery. Active hypertension is a result of an increase in the pulmonary arteriolar resistance, either physiological or pathological, and is associated with considerable increase in pulmonary artery pressures. In studying the skiagrams for evidence of pulmonary hypertension, the entire vascular system must be carefully scrutinized because the heart size, the size of the hilar vessels, and the more peripheral vessels when used alone do not mirror the level of the pressure. Estimation of the degree of pulmonary hypertension is reasonably accurate in pressure ranges of nought to 30, 30 to 70, and over 70 millimetres of mercury. These pressures should be graded as normal, moderate, and severe.

Carcinoma of the Head of the Pancreas.

G. LEVENE AND S. SCHEFF (*Radiology*, May, 1958) state that a study of the common bile duct by intravenous cholangiography is a valuable adjunct in the early diagnosis of carcinoma of the head of the pancreas. A portion of the common duct is embedded in the head of the pancreas. As the head of the pancreas increases in size, it carries the common duct with it. The lower third of the duct then assumes a typical curved form with its convexity to the right. The authors believe that this sign, when present, definitely localizes a mass to the region of the head of the pancreas.

RADIOTHERAPY.

Combined Isotope and Cobalt Bomb Irradiation in the Bladder.

C. F. RUSCHE AND H. L. JAFFE (*J. Urol.*, March, 1958) report on a method of treatment for advanced carcinoma both of the bladder and of the prostate by means of injection of radioactive colloidal chromic phosphate into the bladder combined with external cobalt bomb therapy. Properly applied, this combined method of treatment is well tolerated and free from serious complications. The radiation reaction in the skin is low and there is very little radiation sickness in spite of the delivery of a large tumour dose. These results were impossible with the conventional 200 to 250 kv. therapy machines. There is a striking absence of secondary contracture of the bladder after cobalt

bomb therapy compared with that after conventional X-ray treatment. An important part of the technique designed to lessen skin reactions is rotation of the patient in various ways. Even with the concentrated prostatic attack, the local reaction in and around the rectum subsides after a few weeks. No serious depression of the bone marrow has been observed with this type of irradiation. When evidence of bone marrow depression occurs it usually indicates metastases to the bones, even though radiological evidence of such is absent; sternal or iliac crest punctures may record bone metastases before X-ray evidence is apparent. Thirty-six patients with advanced vesical carcinoma have been treated by this method and followed for almost three years. Of these, 24 had transitional-cell carcinomata, eight had an epidermoid type of tumour, two had adenocarcinomata, and two undifferentiated types of tumours. In 16 of these the initial result was good, and in six treatment had been incomplete or was too recent to assess the result. Out of 15 patients with prostatic carcinoma, two received cobalt bomb therapy alone and 13 had a combination of isotope injection followed by cobalt bomb therapy. In about two-thirds of these 15 patients the initial result seemed worthwhile.

Malignant Melanoma.

R. J. DICKSON (*Am. J. Roentgenol.*, June, 1958) states that in most classifications of the radiosensitivity of tumours, malignant melanoma is regarded as a radio-resistant lesion. Some do not consider this is wholly true, and the author, working at the Toronto General Hospital and the Johns Hopkins Hospital, presents a series of 254 cases, some of which have had radical surgery alone and others in which post-operative irradiation has been given in an attempt to improve the prognosis, and to reassess the response of the tumour to radiation. The age and sex incidence and body distribution are also discussed. Forty-two patients underwent radical surgery, without post-operative irradiation; of these, 11 (26%) survived for five years; 121 patients had post-operative irradiation in addition to surgical treatment, and of these 41% survived for five years. The author concludes that adequate radiotherapy is a valuable adjunct to wide excision in the surgical treatment of malignant melanoma.

Lung Changes after Irradiation for Breast Carcinoma.

D. BATE AND R. J. GUTTMANN (*Radiology*, September, 1957) discuss changes in lung and pleura following two-million volt therapy for carcinoma of the breast. A series of 50 patients with cancer of the breast were treated on the two-million volt unit. A lymph node tumour dose of 3000*r* to 5000*r* was delivered at the rate of 100*r* a week. One field included the axillary, supraclavicular and intraclavicular regions, and the second, the internal mammary nodes. In some patients tangential fields were added. Lung changes were noted in 40 of the 50 patients who were followed up for at least six months. Thirty-five of the 40 had definite post-irradiation "pneumonitis" and the other five had probable pneumonitis associated with pulmonary metastases. The initial change is a diffuse haze, followed by fibrotic strands, but these changes may be completely reversible. Subjective complaints were present in seven patients and were treated symptomatically. Supervoltage therapy does not spare the normal tissues as premature claims by other authors once promised. On the contrary, and quite understandably, the deep-lying normal structures receive increased dosage.

Cancer of the Cervix.

N. M. OTSEP (*Vop. Onkol.*, 1956, 2: 522) reports a study of 56 uteri removed surgically from patients suffering from cancer of the uterine cervix (54 in stage I and two in stage III). In the pre-operative period 47 of the patients had been submitted to combined irradiation treatment, while nine patients had X-ray irradiation alone. The author established that pre-operative X-ray and radium treatment of cancer of the uterine cervix produces either destruction of all cancerous tissue with cicatrization of the affected areas, or severe dystrophic changes in the cancerous tumour. X-ray therapy, in a number of cases, assists the absorption of infiltrate in the true pelvis, thus making subsequent surgical interference easier.

Tumours of Glomus Jugulare.

I. G. WILLIAMS (*J. Fac. Radiologists*, 1957, 8: 335) discusses the results of treatment in 12 cases of tumour of the glomus jugulare, with special reference to the factors influencing the type of radiotherapy treatment to be used in such cases. An analysis of the treatment in all patients is given. These tumours showed definite radiosensitivity, but relapses were noted after treatment with doses of 5000*r* and 4000*r*, so that higher doses are probably necessary.

SURGERY.

Vertebral Osteoclastoma with Spinal Cord Compression.

N. WHALLEY (*Brit. J. Surg.*, January, 1958) states that primary vertebral neoplasms are uncommon, although from time to time such tumours as osteoma, chondroma, hæmangioma, sarcoma, Ewing's tumour and chordoma may be encountered. Radiologically, it is easy to confuse osteoclastoma with aneurysmal bone-cyst, and it is important to differentiate between osteoclastoma and dystrophic cysts of bone. Dystrophic cysts tend to spontaneous repair, while osteoclastoma is always aggressive and destructive. The author was able to find 33 cases of spinal osteoclastoma in the literature and, of these, in 18 there was evidence of spinal cord or cauda equina involvement. Four cases are reported by the author, the ages of the patients being 12 years, 15 years, 29 years and 16 years. All patients had evidence of spinal cord compression and in all cases the lesion was verified histologically. Three of the patients were treated by surgical decompression of the spinal cord, supplemented with deep radiation therapy, and the fourth patient with radiotherapy alone after diagnosis had been established histologically. All four patients made good recoveries. Radiotherapy alone can produce remarkable results in osteoclastoma of the long bone, but biopsy and accurate verification before treatment would appear to be wise.

Intravenous Fat after Severe Injuries.

C. P. ARTZ AND T. K. WILLIAMS (*Am. J. Surg.*, April, 1958) gave a total of 302 units of a commercially prepared fat emulsion to 28 patients. During five of the infusions reactions such as nausea, chills and urticaria occurred. These were very minor and the patients showed no untoward effects when reinfused with fat emulsion on the following day. After 18 infusions in various patients a benign rise in temperature to above 100·6° F. was noted. Only one patient showed a serious response. This consisted of jaundice after 24 infusions. At the present time it appears that moderate quantities of fat emulsion are safe for clinical use, but large quantities may evoke a severe response. Interference with liver function and the coagulation mechanism after intravenous fat emulsion infusions over a prolonged period is the primary problem requiring further study. Metabolic balance studies were carried out on several patients. Data on six typical patients show the protein-sparing effect of intravenous fat emulsion. This preparation appears to be a useful adjunct in injured patients and other patients who are unable to take adequate calories by mouth.

Complications of Circumcision.

L. T. BYARS AND W. C. TRIER (*Arch. Surg.*, March, 1958) point out that while circumcision is a simple operation and serious complications are unusual, it requires the same exactness of technique, attention to detail and respect for tissues as any other surgical procedure. They report cases of urethral fistula as a sequel of circumcision, loss of the skin of the penis, laceration of the glands and urethral meatus, total or partial slough of the penis from use of the electro-surgical unit, loss of the penis from the use of a rubber band as a tourniquet, and loss of the glans itself. These complications can happen after either surgical or ritual circumcision.

Carcinoma of the Tongue.

H. W. SOUTHWICK, J. W. OTTEN AND D. P. SLAUGHTER (*Surgery*, February, 1958) discuss the treatment of squamous cell carcinoma of the tongue. They find that the primary tumour can be controlled with essentially equal effectiveness by surgery or irradiation. They consider that for lesions at the base of the tongue irradiation is superior. Radical neck dissection is the treatment of choice for metastatic disease. They find that clinical examination of the neck for the presence of metastatic disease fails to detect its presence in at least 40% of the patients affected. They therefore consider that results are so much improved when neck dissections are performed routinely as part of an *en bloc* procedure that serious consideration should be given to elective neck dissection in conjunction with the primary treatment of carcinoma of the tongue in all cases.

On the Periphery.

THE HAUGHLEY EXPERIMENT.

THE experimental work that is being carried out at Haughley could possibly lead to a very great advance in human and animal nutrition.

It was begun in 1938, when Miss Alice Debenham and Lady Eve Balfour put their neighbouring farms under the trust of the Suffolk County Council, with five managing trustees for carrying out the experiment; the combined holding was divided into three self-contained farms, one of 32 acres and two of 75 acres each; the small farm was to have no animals, but to raise crops with the help of chemical fertilizers and green manures. It was to be worked on a five-year rotation of wheat, sugar beet, barley, barley, green-crop fallow; all cereal crops were to be undersown with trefoil for ploughing back.

The two 75-acre farms follow an eight-year rotation, with four-year leys followed by four crops—oats, barley, peas and beans, and wheat, undersown to the coming ley. But each has some permanent pasture, and some acres of lucerne and root crops. Each farm has also 25 to 30 head of cattle, 200 laying hens, with their chickens, two breeding sows and a horse. No food is bought for the stock, except some dried seaweed, mineral licks and a little fish meal for the poultry, and the only seed from outside is the ley mixture, lucerne and roots for two acres.

> The first of these two units is worked as an organic farm. Deep-rooting herbs are used in the composition of the leys; all the farmyard manure is made into compost. . . . No fertilizers or compost-making materials are imported. Thus the soil receives—whether as crop residues or manure—only those waste products which the unit itself produces.

In the other 75-acre unit the farmyard manure is applied either direct or after rotting in a heap, and the conventional chemical fertilizers are used in the generally accepted quantities.

Reasons for the Experiment.

Lady Eve Balfour, who had been a farmer all her life, had observed for herself that crops grown on land fertilized by animal and green manure seemed to be superior in quality to those grown with chemical manures; she also noticed that they withstood drought better and were more resistant to disease and the various gnawing pests. These observations were supported by those of many other intelligent farmers and also by the work of Sir Ernest Howard, who was convinced, after prolonged observation, not only that crops grown on compost were superior to those grown on chemical manures, but that animals and people fed on such crops were healthier and more resistant to disease.

Howard says:

> When the health and physique of the various northern Indian races were studied in detail the best were those of the Hunzas, . . . where an ancient system of irrigated terraces has been maintained for thousands of years in a high state of fertility. There is little or no difference between the kinds of food eaten by these hillmen and by the rest of northern India. There is, however, a great difference in the way these foods are grown. The total area of the irrigated terraces of the Hunzas is small; . . . the irrigation water brings annual additions of fine silt produced by the neighbouring glacier; the very greatest care is taken to return to the soil all human, animal, and vegetable wastes after being first composted together. . . . A perfect agriculture, in which all the factors that combine to produce high quality in food, naturally results. . . .
>
> A study of the races of India and of their diet, coupled with the experimental work on rats carried out by McCarrison, leaves no doubt that the greatest single factor in the production of good health is the right kind of food and the greatest single factor in the production of bad health is the wrong kind of food. Further, the very remarkable health and physique enjoyed by the Hunza hillmen appears to be due to the efficiency of their ancient system of farming.

I imagine that no doctor would disagree with any of that quotation, except perhaps with the last sentence, where the majority of orthodox nutritionists would probably claim that there is no satisfactory proof that the quality of the soil on which crops are grown has any bearing on the health of the men and beasts fed on those crops, provided the right amounts of proteins, carbohydrates and fats, with the essential minerals and vitamins, are eaten.

However, McCarrison agrees with Howard that resistance to disease varies with diet, and that the quality of food is influenced by the quality of the soil on which it is grown.

Lady Eve Balfour and Miss Debenham, with those who supported them, believed that this point should be proved, by means of a large-scale and long-term experiment, and designed the Haughley Trust to carry it out. Or, as Sir C. Stanton Hicks sees it: "Haughley, to me, is a concrete embodiment of the idea that we are inadequately informed on the nature of 'quality' in products of the soil, and by implication that indifferent human health might be explained as a result of research directed along new lines."

Effects of Modern Farming.

It seems to me that both facts and theory suggest that a great many modern methods of farming may be responsible for many kinds of lowered health; there is no doubt at all that they are responsible for destroying first the fertility and then the existence of many millions of acres of once magnificent farm land.

Speaking of the present rate of erosion in America, Jacks and White estimate that, if it continues, America, within a century, could become a Sahara; they believe that between 1914 and 1939 the world probably lost more soil than in all previous history.

Werthen estimates that the U.S.A. loses by erosion 3,000,000,000 tons of soil annually, the Mississippi alone carrying 700,000,000 tons into the Gulf of Mexico.

> Mile high, those gloomy curtains of dust are the proper back-drop for the tragedy that is on the boards. The lustful march of the white race across the virgin continent strewn with ruined forests, polluted streams, gullied fields, stained by the breaking of treaties and titanic greed, can no longer be disguised behind the camouflage which we call civilization.

There is no doubt that rapid erosion is going on in every continent; if it is not yet as disastrous as in America, that is probably because American agriculture is more "advanced" than that of any other country, using more tractors, more bulldozers and more chemical manures in a desperate hurry to produce more crops than Nature intended should be forced from the soil. If in Australia erosion has not been so spectacular, it has caused, and is still causing, severe damage.

Of course, every acre of eroded soil means less food production in a world where increasing population calls for more food; and less food must mean more malnutrition and more disease, which is certainly the concern of the medical profession. It is a fair assumption, then, that bad methods of soil management may contribute to the increase of disease, and we should be aware of that possibility.

But nearly all erosion is only the end result of a progressive loss of fertility; really fertile soil is very resistant to erosion, particularly wind erosion, being firmly bound together by its organic content into what is known as the crumb structure. That is soil as Nature intended it to be, and can be seen at its best in any untouched rain forest. Such soil can be intensively farmed without destroying it, as the Chinese have demonstrated during the past four thousand years. In their farming all the wastes, from crops, animals and humans, are returned to the soil as compost, which is as near as we can get to Nature's method of growing grass on the prairies and trees in the forest.

If we consider the greatest changes that have taken place during the last century in farming, feeding and health, we find that in farming it is in methods of fertilizing. A hundred years ago most farms were mixed, and were fertilized by crop residues, green manures and the manure of the farm stock. Then Liebig came with his careful analyses of the chemical contents of plants and his theories of manuring with nitrogen, phosphorus and potassium, and farming practice rapidly changed; mixed farming decreased and monoculture increased; there was less fertilizing with organic manures and more with chemicals. Agriculturists seemed to forget that a plant is a biological product as well as a chemical one, and that the natural soil, besides its chemicals, has decayed and decaying organic matter, worms, fungi and a host of microorganisms, which are all likely to play a part in the growth of vegetation. The part played by fungi in the growth of pine trees was demonstrated by Dr. Rayner in the Forestry Commission's plantation in Dorset, where she proved the great importance of the mycorrhizal association established between fungi and the roots of young pines:

> The earlier experiments at Wareham proved conclusively that mycorrhizal association is causally

related with healthy growth, and experimental soil treatments were designed to ameliorate the conditions believed to be responsible for inhibition of fungal activity, and ultimately for defective root growth of the pines sown or planted in the area. . . . These various observations are held to support the view that compost, and very probably phosphate also when applied in the form of basic slag or bone meal, act indirectly, and that their organic constitution, and their effects on the soil micro-flora are more critically important to the growth of conifers than the quantity of available nutrients which they may contain.

Darwin established the importance of earth worms in vegetable growth, and all our agricultural experts pay lip service to the importance of organic matter in the soil, but it is only a still small voice, too often drowned in the voice of the whirlwind shouting for more and more millions of tons of chemical fertilizers.

Of course, crops can be grown on the poorest soil with the use of the necessary chemicals, but with steady over-cropping and the stimulus of ever-increasing doses of nitrogen, phosphorus and potassium the structure of the soil deteriorates, the organic matter is burned up, and all the natural inhabitants of the soil depart, leaving a dead dust that will blow from the Riverina to New Zealand with the first drought and the first westerlies.

The importance of organic matter in the soil is now universally accepted, in theory, but the great majority are still to be convinced that food grown on soil rich in its proper organic contents is more nourishing than the same quantity of food grown on impoverished soil. But even without proof, theoretical considerations would make it seem probable that it is so. If we go back to the earliest stages of human development, it is obvious that man was nourished, directly or indirectly, from plants grown in a soil that ultimately received back into itself all that had grown out of it. One must believe that in the course of many millennia, plants, animals and men adapted themselves as perfectly as possible to such an environment, which did not change much until historic times. Rome demonstrated clearly what civilization can do to a fertile country; I have read that one of the Latin writers, the elder Pliny, I think, said that his grandfather had walked in the shade of forest trees from the Nile to Carthage; then Libya became the granary of Rome and was cropped until its fertility vanished, and century by century the soil vanished, too, to leave it the desert it now is.

To return to the main argument: if man was adapted to live on food grown in a certain kind of soil, is it not reasonable to suppose that he will not live so well on food grown on a quite different soil? Several large-scale observations (the Hunzas and Sikhs, the inhabitants of Tristan da Cunha and the Chinese peasants, when they got enough to eat) tend to confirm this, as do several small-scale experiments with animals and human beings.

With the changes in agricultural methods there have also been great changes in the feeding habits of people; instead of eating food more or less as it was produced, most of us now eat food that has been over-refined, processed and preserved, besides being grown on soil that is, in general, less fertile than it once was.

Along with the changes in agriculture and feeding is a change in the health of the people, of domestic animals and of plants. We live longer, but that is mainly due to a greatly lessened infant mortality and to the lessened deadliness of most of the infectious diseases; but along with this lessening of the deadliness of many of the killing diseases there is a steady increase in many of the degenerative diseases, and in virus diseases, and in obstinate cases of dermatitis of various origins, and of allergic troubles, and especially of nervous disorders—one thinks of McCarrison's rats, which when fed on a poor civilized diet became neurotic and quarrelsome, even to a murderous degree.

Disease in domestic animals has increased also, and diseases of plants, especially virus diseases, are steadily on the increase, in spite of a constant outpouring of new poison sprays and more powerful pesticides.

Changing Ideas of Diet.

Not so long ago it was thought that all a man needed for health were the right amounts of proteins, fats and carbohydrates to produce the requisite number of calories; then it was found that men could die on such a diet, and the crucial role of the vitamins was discovered. Is it possible that there may be other factors, even more elusive than the vitamins, that are influenced by the fertility of the soil? That is one of the questions which the people working at Haughley are trying to answer.

The editor of *The Soil Association Journal* says:

> . . . the information it is providing is likely to be helpful to farmers, of fundamental significance to doctors, dentists and nutritionists, and so to be of benefit ultimately to the whole human race. But its aim is not to make things happen according to plan, or to manipulate Nature . . . but to furnish means for observing, as accurately and over as long a period as possible, what actually *does* happen under each of three contrasted systems of soil management.

Haughley and Early Results.

The experiment is to be conducted:

(a) Over a period of many years, so that continuity is secured.

(b) Over successive generations of plants and animals nurtured in the same way, so that cumulative effects may have full play.

(c) On a regular rotational basis and on a field scale, so that all other conditions may be those of ordinary farming practice.

(d) On areas of land as nearly as possible comparable as regards soil types, drainage and other basic factors, including management.

Haughley is now financed by the Soil Association; each unit is under a manager who believes in the farming method of his unit, and Lady Eve Balfour is Field Director; she has always invited the interest and inspection of all concerned with agriculture or nutrition, especially agricultural officials. The latter were very aloof and rather contemptuous at first, but many of them are now realizing the importance of the experiment.

Wherever possible the work is checked by analysis, Dr. R. F. Milton, B.Sc., Ph.D., F.R.I.C., M.I.Biol., being in charge since 1951; among other appointments he was, during the war, Biochemist-in-Charge of the Medical Research Council's Department of Industrial Medicine, which should guarantee the quality of his work.

Although it is only the beginning of a long-term investigation, many suggestive facts are emerging.

Only a few of the many interesting results that have been noted at this early stage can be given:

> Superficial, but regular, observation over the past five years suggests that the soil of the stockless fields is losing structure; it has a tendency to waterlog after rain, to become dusty following drought, and to pan.
>
> Average figures for the fields from the three sections indicate that the humus content is tending to rise in the Organic section, is markedly lower in the Mixed section despite the fact that this section receives the same bulk of plant and animal residues as the Organic section, and is falling steadily on the Stockless section.
>
> The fields on the Organic section rich in humus show also increasing levels of total nitrogen. . . . This rise is not apparent on the Mixed and Stockless sections despite the yearly additions of nitrogenous fertilizers. The increase, therefore, must arise as a result of a stimulation of nitrogen fixing organisms.

Frequent analyses for vitamin content of the various products of the farms has shown no appreciable difference for the three sections for vitamin C; thiamine, riboflavin and nicotinamide in the 1955 crops of wheat were highest in the Organic section and lowest in the Stockless; other cereals showed the same quantities of the B vitamins from the Organic and Mixed Farms, but the Stockless showed less.

Analysis of silage and hay showed that, although the growth from the Mixed section was more lush, there was a higher total solids content from the Organic section, and presumably it is the solids that nourish. The protein content of the lucerne is consistently higher in what is grown on the Organic section.

In general, analysis of crops for proteins, fats and carbohydrates gives the highest values for those grown on the Organic section and the lowest for those grown on the Stockless.

> Perhaps the most provocative fact is that the crop yields on the Organic section have been up to or even higher than those on the Mixed section where chemical fertilizers are added on the assumption that increased yields will result. It is true that so far the experiment is of short duration, but soil analysis shows that, rather than fertility on the Organic section diminishing as a result of crop demands, the reverse situation is occurring.

Attention is drawn to the finding that the recovery of nitrogen, phosphorus and potassium seems to bear no relationship to the amounts added in the form of fertilizer. Often, both total and percentage concentrations in Organic crops are equal to or greater than those from the Mixed and Stockless sections where NPK fertilizers are regularly added.

For a four-year period the average weight of the milk per head of the herd on the Organic section was 6850 pounds, and that from the Mixed section was 6190 pounds, and the protein per head *per annum* was 254 and 228 pounds respectively.

In summing up Dr. Milton says:

> The farming system at Haughley may now be considered as just getting into stride. The herds on the two stock-bearing sections have been brought to the point of being a product of their environment. In the soil the effect of the farming procedure is making its mark. Similarly, with the seeds it may be stated that the imprint of the soil on which they were grown is now apparent. Only now it can be said that the relationship between soil, plant and animal is established. Consequently it is henceforth that profitable results from the Haughley work should be forthcoming.

Conclusion.

There is abundant evidence that recent methods of intensive farming, with the use of large amounts of chemical fertilizers, have led to the destruction of soil fertility, followed by erosion, over immense areas. If this destruction of fertility continues it must lead to increased malnutrition and disease.

There is much evidence that this loss of fertility is due to a reduction of the organic content of the soil.

There is also an increasing body of evidence suggesting that crops grown on impoverished soil, even when heavily fertilized with chemicals, give less resistance to disease in those who eat them than crops grown on fertile soil.

These considerations are important for all members of the medical profession, who should therefore be interested in the Haughley experiment, so admirably designed to investigate them.

E. P. DARK.

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British Medical Association.

VICTORIAN BRANCH.

Section of Preventive Medicine.

A MEETING of the Section of Preventive Medicine of the Victorian Branch of the British Medical Association will be held in the Medical Society Hall, 426 Albert Street, East Melbourne, on Thursday, November 13, at 4.30 p.m. Sir Macfarlane Burnet will speak on his impressions of the International Cancer Congress. All those interested are invited to attend.

Members of the Section are reminded that the annual general meeting and election of office-bearers will immediately precede Sir Macfarlane Burnet's talk at 4.30 p.m.

SIR CHARLES HASTINGS AND CHARLES OLIVER HAWTHORNE CLINICAL PRIZES, 1959.

THE Sir Charles Hastings Clinical Prize competition is established by the British Medical Association for the promotion of systematic observation, research and record in general practice. The competition has been extended by the addition of a second prize known as the Charles Oliver Hawthorne Clinical Prize. The following are the regulations governing the awards:

1. The Sir Charles Hastings Clinical Prize, consisting of a certificate and £75, will be awarded for the best entry.

2. The Charles Oliver Hawthorne Clinical Prize, consisting of a certificate and £50, will be awarded for the second best entry.

3. Any member of the Association who is engaged in general practice is eligible to compete for these prizes.

4. The work submitted must include personal observations and experiences collected by the candidate in general practice, and a high order of excellence will be required. If no work entered is of sufficient merit no award will be made. Candidates in their entries should confine their attention to their own observations in practice rather than to comments on previously published work on the subject, though reference to current literature should not be omitted when it bears directly on their results, their interpretations and their conclusions.

5. Entries must be sent to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1, not later than December 31, 1958.

6. A prizewinner in any year is eligible for an award of either of the prizes in any subsequent year. A study or essay that has been published in the medical Press or elsewhere will not be considered eligible for a prize, and a contribution offered in one year cannot be accepted in any subsequent year unless it includes evidence of further work.

7. If any question arises in reference to the eligibility of the candidate or the admissibility of his or her entry, the decision of the Council on any such point shall be final.

8. Preliminary notice of entry for this competition is required, on a form of application to be obtained from the Secretary.

9. Each entry, which should be unsigned, must be typewritten or printed on one side of the paper only and accompanied by a separate note of the candidate's name and address.

10. No definite limits are laid down as to the length of the work submitted, but the Council anticipates that for this competition 3000 to 10,000 words would be suitable.

11. Inquiries relative to the prizes should be addressed to the Secretary.

PRIZE ESSAY COMPETITION FOR PROVISIONALLY REGISTERED PRACTITIONERS, 1959.

THE Council of the British Medical Association is prepared to consider the award, in 1959, of prizes to provisionally registered practitioners for essays submitted in open competition.

The subject of the essay is: "To What Extent are Experiments on Animals Essential for Medical Progress?"

Any provisionally registered practitioner in the preregistration year at the time of submission of the essay is eligible to compete for a prize. No study or essay that has previously appeared in the medical Press or elsewhere will be considered eligible for a prize.

If any question arises in reference to the eligibility of a candidate or the admissibility of his or her essay, the decision of the Council of the British Medical Association shall be final. Should the Council decide that no essay entered is of sufficient merit, no award will be made.

At least one prize of £50 is offered. In determining the number of prizes to be awarded, the Council will take into consideration the number and standard of essays received.

Essays must not exceed 5000 words, and must be typewritten or legibly written in the English language on foolscap paper, on one side only, must be unsigned, and must be accompanied by a note of the name and address of the entrant. Notice of entry for this competition is necessary, and a form of application can be obtained from the Secretary of the British Medical Association. Essays must be forwarded so as to reach the Secretary of the British Medical Association not later than January 31, 1959.

Inquiries relative to the competition should be addressed to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1.

PRIZE ESSAY COMPETITION FOR MEDICAL STUDENTS, 1959.

THE Council of the British Medical Association is prepared to consider the award, in 1959, of prizes to medical students for essays submitted in open competition.

The subject of the essay is: "The Playing Field is a Better Place than the Library for a Medical Student's Spare Time in the Preparation for His Life's Work."

Prizes of £25 will normally be offered, but the Council will take into consideration the number and standard of the essays received when determining the awards to be made.

Any medical student who is a registered member of a medical school in the United Kingdom, Commonwealth and Empire or the Republic of Ireland at the time of submission of the essay is eligible to compete for a prize.

Previous prizewinners are eligible for a second award.

If any question arises in reference to the eligibility of a candidate or the admissibility of his or her essay, the decision of the Council of the British Medical Association shall be final. Should the Council decide that no essay entered is of sufficient merit, no award will be made.

Essays must not exceed 5000 words, and must be typewritten or legibly written in the English language on foolscap, on one side only, must be unsigned, and must be accompanied by a note of the name and the medical school of the entrant. Notice of entry for this competition is necessary, and a form of application can be obtained from the Secretary of the British Medical Association. Essays must be forwarded so as to reach the Secretary of the British Medical Association not later than January 31, 1959.

Inquiries relative to the competition should be addressed to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1.

Correspondence.

A LESSON IN HUMILITY.

SIR: In your Journal of September 20, Dr. Godfrey Harris inquired about the source of the Greek words inscribed on an architrave in B.M.A. House, Sydney. I referred his query to the Reverend Charles W. A. Fraser, S.J., of Riverview College, Sydney. Father Fraser kindly informs me that the words come from the Septuagint and may be found in the Book of Ecclesiasticus (Sirach), Chapter 38, Verse 2. The Douay version translates: "For all healing is from God." The Knox version reads: "Since from God all healing comes."

Yours, etc.,

135 Macquarie Street, Sydney,
October 14, 1958.

GREGORY FLYNN.

ACOUSTIC NEURILEMMOMA.

SIR: In a leading article in your Journal of September 27, 1958, you say: "It seems a sad reflection on otology that a review of 300 cases of acoustic neurilemmoma by K. Cambon and F. R. Guildford has revealed that only 10% were diagnosed by otologists." Why should this be? The reasons, I think, are two. First, the available tests of eighth nerve function are often not sensitive enough to demonstrate these tumours in their early stages. Secondly, when later there is evidence of extension beyond the nerve itself, the neurological manifestations lead the patient to the neurologist or neurosurgeon, not the otologist.

When a patient presents with the symptoms of deafness, head noises and giddiness in varying combination, he usually has to submit to audiometric, loudness balance and caloric tests (all of these take a good hour to do). How reliable are these, our most modern tests of eighth nerve function in the diagnosis of acoustic neurilemmoma? The audiogram is not typical, the recruitment of loudness phenomenon is not such a categorical arbiter as it may seem, nor are the caloric tests infallible, as your article rightly implies. When they do reveal enough to suggest the possibility of a tumour it is exceptional for the subsequent neurosurgical investigations to demonstrate it, the tumour no doubt being too small at this stage. Then comes the interval—a matter of years, as you say—and the patient presents with evidence of intracranial spread and is therefore seen by a neurologist or neurosurgeon. In other words, until more accurate tests of eighth nerve function can be devised, it will continue to be difficult for otologists to diagnose these tumours in their early stages; neurologists and neurosurgeons will also continue to be the happy physicians who see the patient last.

It is not uncommon to hear senior otologists say that they have never made a primary diagnosis of eighth nerve tumour on otological findings alone. This, I feel, is not altogether their fault, and I hope that my letter may help to show why. Nevertheless, it does not absolve them from the need for constant vigilance. Your article should help to ensure that this vigilance is maintained.

Yours, etc.,

R.P.A.H. Medical Centre,
100 Carillon Avenue,
Newtown,
New South Wales.
October 7, 1958.

VOLNEY BULTEAU.

COD LIVER OIL, VITAMIN E AND THE PRO-OXIDANT THEORY OF PINK DISEASE.

SIR: In a recent paper (M. J. AUSTRALIA, May 24, 1958) I suggested that pro-oxidants other than colloidal mercury from ingested calomel were responsible for the few non-calomel cases in Australia. Certain observations by other workers can also be explained in terms of a pro-oxidant theory of pink disease which may be described, in part at least, as a conditioned avitaminosis E.

1. Professor Wright,[1] commenting on Dr. G. Forsyth's beneficial results with vitamin E, noted a resemblance between some of the clinical features of young rabbits with a low vitamin E supply and those of pink disease. It may be of interest to recall that nutritional muscular dystrophy can be readily induced in Herbivora by dietary cod liver oil which favours the destruction of vitamin E through the development of oxidative rancidity in the intestine. In the presence of cod liver oil, the addition of vitamin E does not prevent nor cure the avitaminosis. It is suggestive that Dr. Forsyth used halibut liver oil as a source of vitamins A and D in his cases.

2. Dr. D. B. Cheek's finding of hæmoglobin in the plasma suggests low tocopherol levels, *plus* a toxic agent (probably organic peroxides).

3. There is recorded in the literature that one infant with pink disease had received iron treatment for some months and that another had received large doses of cod liver oil.

4. It is common pædiatric practice in England to prescribe cod liver oil during the winter months for infants from four months to two years of age for bronchitis. In contrast to Australia, it has been reported that pink disease in England is more common in the spring; that bronchitis is associated in some way with pink disease and that non-calomel cases are by no means rare.

5. Mason[2] discusses the possibility of a natural or conditioned vitamin E deficiency during infancy and early childhood, when tocopherol reserves tend to be low, particularly under conditions of "metabolic stress", due to excessive intake of unsaturated fats, etc.

6. Pink disease appears to be very rare in Sydney, since the banning of calomel powders on the open market as a sequel to the writer's experimental findings. However, English figures (quoted by Colver[3]) are not altogether con-

[1] M. J. AUSTRALIA, 1940, 1: 607.

[2] In "The Vitamins", edited by W. H. Sebrell and R. S. Harris, Academic Press, New York, 3: 514.

[3] *Brit. M. J.*, 1956, 1: 897.

vincing and suggest further agents. The modern use of halibut liver oil, in lieu of cod liver oil, may be a factor in the decline.

In my recent series of papers, an attempt was made to correlate the pro-oxidant theory with the mercury theory. However, the evidence presented does not support a mercury theory. It would appear that absorbed mercury is of significance only in atypical cases which respond to dimercaprol (BAL) when calomel plays a dual role, with absorbed mercury as the major factor. It is concluded that unabsorbed mercury (in the colloidal state) is the ætiological factor in typical calomel cases; that other sources of mercury and the mercurial symptoms are incidental to pink disease.

Yours, etc.,

F. R. BARRETT.

School of Public Health and Tropical Medicine,
University of Sydney,
September 30, 1958.

Out of the Past.

In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.

"PAY WARDS" IN HOSPITALS.

[From the *Australasian Medical Gazette*, March, 1893.]

THE Committee of Management of the Alfred Hospital in Melbourne have reduced the number of free beds from 100 to 80. With reference to this action of the Committee, the Hon. Medical Staff have passed the following resolution: "That the medical committee sympathize with the managers in their endeavours to increase the funds of the hospital in the direction of obtaining from patients who can pay the expense of their maintenance. They would desire, however, to point out that a system of pay wards is liable to abuse and to ask that such precautions be taken as will secure that only those persons are admitted to the benefit of the pay wards who are unable to pay for medical or surgical attendance."

Post-Graduate Work.

THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY.

Week-End Conference at Newcastle (Surgery).

THE Post-Graduate Committee in Medicine in the University of Sydney, in conjunction with the Central Northern Medical Association, will hold a week-end conference in the Lecture Theatre at the Mater Misericordiæ Hospital, Waratah, on Saturday and Sunday, November 1 and 2, 1958. This programme will cover the Section on Surgery and is as follows:

Saturday, November 1: 2.30 p.m., registration; 2.45 p.m., "Occlusive Vascular Disease", Dr. Justin Fleming; 4.30 p.m., "Bilious Vomiting in Childhood", Dr. David Dey.

Sunday, November 2: 9.30 a.m., "Congestive Ulceration of the Leg", Dr. Justin Fleming; 10.45 a.m., "Burns", Dr. David Dey.

The fee for attendance at this conference of the Section on Surgery is £1 1s., and those wishing to attend are requested to notify Dr. H. N. Rose, Honorary Secretary, Central Northern Medical Association, 581 Glebe Road, Adamstown, as soon as possible. Telephone: LU 1047 (Newcastle).

Week-End Course in Dermatology.

The Post-Graduate Committee in Medicine in the University of Sydney announces that the following week-end course in dermatology, under the supervision of Dr. A. Geoffrey Finley, will be held in the Maitland Lecture Theatre, Sydney Hospital, and the Scot Skirving Lecture Theatre, Royal Prince Alfred Hospital, Camperdown, on Saturday and Sunday, November 8 and 9, 1958. The programme will be as follows:

Saturday, November 8, in the Maitland Lecture Theatre, Sydney Hospital: 10 a.m., clinical demonstration, Dr. L. G. Abbott; 11.30 a.m., "Plantar Warts", Dr. Rex Becke; 12 noon, "The Problem of Urticaria", Dr. W. W. Gunther; 1.30 p.m., "Recurrent Staphylococcal Infections", Dr. W. Keith Myers; 2.15 p.m., "The Management of Moles (Including Malignant Moles)", Dr. M. B. Lewis; 2.45 p.m., "Drug Eruptions", Dr. E. Murray-Will.

Sunday, November 9, in the Scot Skirving Lecture Theatre, Royal Prince Alfred Hospital: 10 a.m., "The Psyche and the Skin", Dr. A. Johnson; 10.30 a.m., "Scalp Ringworm", Dr. Miles Havyatt; 11.30 a.m., "Tinea Pedis", Dr. Brian McGaw; 12 noon, "Difficult Skin Conditions", Dr. F. J. Collett; 1.30 p.m., "Treatment of Skin Cancer", Dr. A. G. Finley; 2.15 p.m., "Light Sensitivity", Dr. R. B. Perkins; 3.30 p.m., round table conference (chairmen, Dr. R. B. Perkins and Dr. A. G. Finley).

The fee for attendance at this course is £4 4s.

Week-End Course at Lewisham Hospital.

The Post-Graduate Committee in Medicine in the University of Sydney announces that a two-day course, specially designed for general practitioners, will be held at Lewisham Hospital on Friday and Saturday, November 14 and 15, 1958. The course will be available to a limited number of candidates, and the programme is as follows:

Friday, November 14: 10 a.m. (chairman, Dr. John O'Brien), opening address by the chairman; 10.15 a.m., "Diagnosis and Treatment of Lumps in the Breast", Dr. C. F. Bellemore (opener, Dr. E. G. MacMahon); 10.45 a.m., "Dermatological Problems in General Practice", Dr. B. McGaw (opener, Dr. J. Cahill); 11.45 a.m., "Treatment of the Retroverted Uterus", Dr. R. J. McInerney (opener, Dr. R. St. John Honner); 12.15 p.m., "Observations on the Treatment of Diabetes Mellitus", Dr. R. Dalton (opener, Dr. L. Flynn); 2 p.m. (chairman, Dr. Leo Flynn), "Cerebral Vascular Accidents", Mr. Douglas Miller (guest lecturer); 2.45 p.m., "The Changing Face of Osteomyelitis", Dr. J. Roarty (opener, Dr. N. Little); 3.15 p.m., "Ocular Problems in General Practice", Dr. T. M. Armstrong (opener, Dr. G. C. T. Burfitt-Williams); 4.15 p.m., question time on present-day therapy (subjects, "Tranquillizers", "Antibiotics", "Corticosteroids", "Anæsthetic Drugs", "Butazolidin", "Diuretic Drugs"; the panel will consist of Dr. G. V. Hall, Dr. J. P. O'Brien, Dr. N. Bartrop, Dr. W. J. Burke, Dr. K. Priddis and Dr. W. J. Nuffield).

Saturday, November 15: 10 a.m. (chairman, Dr. K. Fagen), "Trying to Assess the Patient's Story", Mr. Douglas Miller (guest lecturer); 10.45 a.m., "Management of the Anæmias", Dr. B. A. Curtin (opener, Dr. L. Flynn); 11.45 a.m., "The Treatment of Acute Obstructions of the Lower Urinary Tract", Dr. R. A. Craven (opener, Dr. R. Harris).

The fee for attendance at this course is £3 3s.

Enrolment.

Those wishing to attend the above week-end courses are requested to make written application, enclosing remittance, to the Course Secretary, The Post-Graduate Committee in Medicine, 131 Macquarie Street, Sydney. Telephones: BU 4497-8. Telegraphic address: "Postgrad Sydney."

Overseas Lecturers.

Dr. Alice Stewart, Reader in Social Medicine at Oxford, will visit Sydney from October 25 to 29, and her programme will include the following lectures: Monday, October 27, at 1.15 p.m. at the Royal Alexandra Hospital for Children: "Newborn Infant Survey." Wednesday, October 29, at 8.15 p.m. in the Stawell Hall, 145 Macquarie Street, Sydney: "Survey of Leukæmia in Childhood." (This lecture will refer to leukæmia in childhood after irradiation of the mother during pregnancy.)

Dr. S. Bernard Wortis, Professor and Chairman, Department of Psychiatry and Neurology, New York University College of Medicine, will be in Sydney between October 29 and November 14. He will visit mental and other hospitals and institutions and give a number of lectures, including the following: Friday, October 31, at 4 p.m. at the Cerebral Surgery Research Unit, Callan Park: "Experiments with Some of the New Drugs Used in Psychiatry." Tuesday, November 4, at 4 p.m. at the Broughton Hall Psychiatric Clinic: "Some New Leads in Schizophrenia." Wednesday, November 5: at 2.15 p.m., seminar at Sydney Hospital, "The Physician's View of Drug Addiction"; at 8 p.m., in the

Robert H. Todd Assembly Hall, 135 Macquarie Street, Sydney, "Psychiatric Research in the United States". Thursday, November 6: at 12 noon, in the Students' Lecture Theatre, Royal North Shore Hospital, "Psychiatric Manifestations of Organic Disease of the Brain"; at 8 p.m., in the Stawell Hall, 145 Macquarie Street, Sydney, "Alcoholism". Friday, November 7, at 1.15 p.m., seminar in the Scot Skirving Lecture Theatre, Royal Prince Alfred Hospital: "Experiments with Some of the New Drugs Used in Psychiatry."

Post-Graduate Training Fellowships in Psychiatry.

The Senate of the University of Sydney has awarded post-graduate training fellowships in psychiatry to Dr. Denis Barker, of South Australia, and Dr. T. C. M. Lonie, of New Zealand.

The Post-Graduate Committee has approved the extension, for one year, of the fellowships held by Dr. J. S. Blow and Dr. J. W. Shand.

Notice.

THE CHILDREN'S MEDICAL RESEARCH FOUNDATION OF N.S.W.

THE following is a list of donations to the Children's Medical Research Foundation of N.S.W. received from members of the medical profession in the period October 1 to 7, 1958:

Dr. Roy B. Millar: £100.

Dr. and Mrs. R. Small: £52 10s.

Drs. G. Diethelm, H. R. Harris, E. P. Holland, J. L. Rae, N. St. C. Mulhearn and K. V. Robinson: £21.

Drs. Rae, David and Colin Cole: £20.

Dr. and Mrs. Raymond Green: £15 15s.

Dr. A. Wajnryb: £10 10s. 6d.

Dr. S. Benedek, Dr. M. H. Bern, Drs. P. and B. Manuel: £10 10s.

Dr. R. J. G. Erby: £10 0s. 6d.

Dr. C. Parkinson, Dr. R. W. Tinsley, Dr. A. A. Golden, Dr. H. B. Carroll: £10.

Dr. J. A. L. Wallace: £6 6s.

Dr. Roy Goulston, Dr. D. A. Ferguson, Dr. George Hall: £5 5s.

Dr. M. Grossy, Dr. M. B. Morgan: £5.

Dr. D. H. Rosenman: £2 2s.

Dr. Leonard Warnock: £1 1s.

Previously acknowledged: £6456 6s. 9d. Total received to date: £6792 16s. 9d.

Royal Australasian College of Surgeons.

RESULTS OF PRIMARY EXAMINATION FOR FELLOWSHIP.

IT is announced that the following candidates satisfied the Board of Examiners at the primary examination for fellowship of the Royal Australasian College of Surgeons, held in September, 1958, and were approved: William Ronald Beetham, John Bell, Gerard William Crock, Richard Spencer Gye, Frederick Charles Hinde, Stanley George Koorey, Peter Kudelka, Gordon Low, John Francis McCaffrey, Eric Leonard Parry, Graeme James Pollock, Richard Anthony Rieger, Ian Shearer Russell, John Peter Sarks, Geoffrey Anthony Gerard Scarlett, Leonard Thomas Stretton.

Faculty of Anæsthetists.

It is announced that the following primary candidates satisfied the Board of Examiners at the primary examination for fellowship of the Faculty of Anæsthetists of the Royal Australasian College of Surgeons, held in September, 1958, and were approved: Graham Chudleigh Fisk, Vera Gallagher, Gordon Alfred Harrison, Mortimer John Croft Muirhead.

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED OCTOBER 4, 1958.[1]

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia.
Acute Rheumatism	2	5(4)	9	..	2(2)	..	..	..	18
Amœbiasis	..	..	4	..	..	..	..	..	4
Ancylostomiasis	3	..	6(2)	..	..	..	9	..	18
Anthrax	..	..	..	..	..	..	..	..	..
Bilharziasis	..	..	..	..	..	..	..	..	..
Brucellosis	..	..	..	..	..	..	..	..	..
Cholera	..	..	..	..	..	..	..	..	..
Chorea (St. Vitus)	..	..	..	..	..	..	..	..	..
Dengue	..	..	..	..	..	..	..	..	..
Diarrhœa (Infantile)	3	14(11)	4(3)	..	..	..	1	22	
Diphtheria	..	..	..	..	..	..	..	..	..
Dysentery (Bacillary)	..	5(4)	1(1)	1(1)	1(1)	1	4	..	13
Encephalitis	..	..	..	..	..	..	..	..	..
Filariasis	..	..	..	..	..	..	..	..	..
Homologous Serum Jaundice	..	2(1)	..	..	..	..	..	..	2
Hydatid	..	..	..	..	..	..	..	..	..
Infective Hepatitis	87(26)	29(14)	5	..	2	1	2	1	127
Lead Poisoning	..	..	..	..	..	..	1	..	1
Leprosy	..	..	..	..	..	..	..	..	..
Leptospirosis	..	..	4	..	..	..	..	..	4
Malaria	..	1(1)	..	..	..	..	..	..	1
Meningococcal Infection	2(1)	1	2(1)	..	..	..	..	..	5
Ophthalmia	..	..	..	..	1	..	..	..	1
Ornithosis	..	..	..	..	..	..	..	..	..
Paratyphoid	..	..	..	..	..	..	..	..	..
Plague	..	..	..	..	..	..	..	..	..
Poliomyelitis	..	8(8)	1	..	..	..	..	..	9
Puerperal Fever	1	..	4	..	..	..	..	..	5
Rubella	..	61(27)	2(1)	6(1)	160(148)	..	3	..	232
Salmonella Infection	..	..	..	1(1)	..	..	..	..	1
Scarlet Fever	6(2)	26(21)	5(2)	2(2)	2(2)	2	..	..	43
Smallpox	..	..	..	..	..	..	..	..	..
Tetanus	..	..	1	..	..	..	..	..	1
Trachoma	..	..	..	..	7	..	..	..	7
Trichinosis	..	..	..	..	..	..	..	..	..
Tuberculosis	16(10)	9(8)	26(18)	11(6)	5(3)	2(1)	..	..	69
Typhoid Fever	..	..	..	..	..	..	..	..	..
Typhus (Flea-, Mite- and Tick-borne)	..	..	..	..	..	..	..	..	..
Typhus (Louse-borne)	..	..	..	..	..	..	..	..	..
Yellow Fever	..	..	..	..	..	..	..	..	..

[1] Figures in parentheses are those for the metropolitan area.

Corrigendum.

IN the report of the third International Congress of the International Diabetes Association, which was published in the issue of September 27, 1958, at page 430, the name of Dr. H. J. Ellis should have been included amongst those who attended the conference. Dr. Ellis represented the South Australian section of the Diabetic Association of Australia. We regret this omission.

Medical Practice.

NATIONAL HEALTH ACT.

THE following notice is published in the *Commonwealth of Australia Gazette*, No. 59, of October 2, 1958.

NATIONAL HEALTH ACT, 1953-1957.

Notice in Pursuance of Section 134A.

Notice is hereby given that the Medical Services Committee of Inquiry for the State of Victoria after investigation, having reported concerning the conduct of Brian Ramsden Schloeffel of 76 Orr Street, Shepparton, medical practitioner, I, Donald Alastair Cameron, the Minister of State for Health, did on the 5th day of September, 1958, reprimand the said Brian Ramsden Schloeffel for conduct which is an abuse of the National Health (Pharmaceutical Benefits) Regulations.

Dated this 5th day of September, 1958.

DONALD A. CAMERON,
Minister of State for Health.

Medical Appointments.

Dr. D. E. Dunn has been appointed Honorary Clinical Assistant, Cardiological Clinic, at the Royal Adelaide Hospital, Adelaide.

Dr. F. C. Archibald has been appointed Honorary Clinical Assistant, Anæsthetics Department, at the Royal Adelaide Hospital, Adelaide.

Dr. D. A. Hicks has been appointed Honorary Clinical Assistant, Cardiological Clinic, at the Royal Adelaide Hospital, Adelaide.

Dr. R. L. Willing has been appointed Medical Superintendent, Northfield Wards, Royal Adelaide Hospital, Adelaide.

Dr. R. F. R. Scragg has been appointed Director of Health in the Territory of Papua and New Guinea.

Dr. S. P. Stevens has been appointed Government Medical Officer at Kingaroy, Queensland.

Dr. L. W. Cox has been appointed Honorary Obstetrician to the Maternity Section and Honorary Gynæcologist to the General Section of the Queen Elizabeth Hospital, Adelaide.

Nominations and Elections.

The undermentioned have been elected as members of the New South Wales Branch of the British Medical Association: Babicka, Alois, M.D., 1946 (Univ. Prague) (registered in accordance with the provisions of Section 17 (2B) of the *Medical Practitioners Act*, 1938-1958); Dimitriadis, Periclis, M.D., 1950 (Univ. Athens) (registered in accordance with the provisions of Section 17 (1c) of the *Medical Practitioners Act*, 1938-1958); Lewin, Abraham, M.D., 1912 (Univ. Breslau) (registered in accordance with the provisions of Section 17 (2A) of the *Medical Practitioners Act*, 1938-1958); Lieder-Mrazek, Michael, M.D., 1950 (Univ. Munich) (registered in accordance with the provisions of Section 17 (1c) of the *Medical Practitioners Act*, 1938-1958); Porges, Stuart Barrington, M.B., B.S., 1958 (Univ. Sydney); Logan, Geoffrey Gibson, M.B., B.S., 1956 (Univ. Sydney); Rado, Tibor, M.D., 1918 (Univ. Budapest) (registered in accordance with the provisions of Section 17 (2A) of the *Medical Practitioners Act*, 1938-1958); Shand, John Wentworth, M.B., B.S., 1955 (Univ. Sydney); Thompson, Blanche, M.B., B.S., 1958 (Univ. Sydney); Allison, George Harris Cory, M.B., B.S., 1956 (Univ. Sydney); Brien, William Robert, M.B., B.S., 1956 (Univ. Sydney); Hensley, William Joseph, M.B., B.S., 1950 (Univ. Sydney), M.D., 1958 (Univ. Sydney), M.R.A.C.P., 1955; O'Connor, Kevin, M.B., B.S., 1952 (Univ. Sydney); Aroney, James Theodore, M.D., 1940 (Univ. Athens), L.M.S.S.A. (London), 1958, L.R.C.P. (London), 1958, M.R.C.S. (London), 1958; Gural, Andreas, M.D., 1944 (Univ. Zagreb) (registered in accordance with the provisions of Section 17 (2B) of the *Medical Practitioners Act*, 1938-1958); Gyory, Albert, M.D., 1928 (Univ. Szeged, Hungary) (registered in accordance with the provisions of Section 17 (2A) of the *Medical Practitioners Act*, 1938-1958).

The undermentioned have been elected as members of the South Australian Branch of the British Medical Association: Jones, Kenneth Thomas, M.B., B.S., 1950 (Univ. Adelaide); Manson, James Ian, M.B., B.S., 1958 (Univ. Adelaide); Mugford, Keith, M.B., B.S., 1956 (Univ. Adelaide).

Diary for the Month.

OCT. 25.—New South Wales Branch, B.M.A.: Branch Meeting.
OCT. 28.—New South Wales Branch, B.M.A.: Hospitals Committee.
OCT. 30.—South Australian Branch, B.M.A.: Scientific Meeting.
OCT. 31.—Queensland Branch, B.M.A.: Clinical Meeting, Mater Misericordiæ Hospital.
NOV. 4.—New South Wales Branch, B.M.A.: Organization and Science Committee.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales. Anti-Tuberculosis Association of New South Wales. The Maitland Hospital.

South Australian Branch (Honorary Secretary, 80 Brougham Place, North Adelaide): All contract practice appointments in South Australia.

Editorial Notices.

ALL articles submitted for publication in this Journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given: surname of author, initials of author, year, full title of article, name of journal, volume, number of first page of the article. The abbreviations used for the titles of journals are those adopted by the Quarterly Cumulative Index Medicus. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors submitting illustrations are asked, if possible, to provide the originals (not photographic copies) of line drawings, graphs and diagrams, and prints from the original negatives of photomicrographs. Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary is stated.

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